VOLUME I
OXNARD NOISE ELEMENT

OXNARD NOISE ELEMENT OF THE GENERAL PLAN

CITY OF OXNARD
PLANNING DEPARTMENT

NOISE ELEMENT OF THE GENERAL PLAN
FOR THE
CITY OF OXNARD

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FOREWORD

Systems Control, Inc., formerly Olson Laboratories, is pleased to submit the Noise Element for the City of Oxnard. This report was prepared with the assistance of the Planning Department and incorporates review comments by the City Council, Planning Commission, and Planning Department on the Draft Noise Element.

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A. BACKGROUND

A quiet environment is a valuable resource, necessary for the physical and psychological well-being of the community. While air and water pollution have been long recognized as major problems, noise has only just recently been identified as a third major pollutant. Unfortunately, urban living and the by-products of technology have been responsible for the increasing noise levels.

Our ears, unlike our eyes, have no device to shut out unwanted stimuli. Therefore, people are exposed to a vast array of sounds in the acoustical environment. The major effects of this exposure to noise are annoyance, inconvenience, and temporary or permanent hearing loss.

Noise levels have been rising in our cities at the rate of 1 decibel per year for the past 30 years. The existing noise environment and the expected future growth in the City of Oxnard make it imperative to include noise considerations at various stages of the planning process to minimize adverse effects associated with noise.

B. LEGISLATIVE MANDATE

The State of California has recognized the seriousness of noise pollution and has responded by mandating the requirement of a Noise Element to The General Plan. California Government Code, Section 65302(g), as amended by SB 860 and "Guidelines for the Preparation and Content of Noise Elements of the General Plan" requires each city and county in California to adopt a Noise Element for incorporation into its General Plan.

C. SCOPE AND PURPOSE

The scope of the Noise Element study includes the City of Oxnard and its planning area. The total study area covers approximately 75 square miles.

The purpose of the study is to provide a basis for comprehensive local programs to control and abate environmental noise and to protect citizens from excessive exposure. The Noise Element identifies the sources of noise, analyzes the extent of the noise intrusion and estimates its potential impact upon the City. This identification process provides the basis for goals, policies, and programs designed to preserve, where possible, and restore, where feasible, a quiet environment in the City of Oxnard.

The noise management programs outlined in the Noise Element imply a commitment of resources to fulfill their objectives. The City must first establish the standards and criteria necessary for a quiet environment, based upon accepted health and welfare data, and local, State and Federal standards. Implementation programs must balance what is practically achievable versus what is merely desirable. The primary consideration should be to balance the benefits of a quieter environment against the technological feasibility and economic viability of the proposed programs designed to achieve this goal.

D. RELATIONSHIP TO OTHER ELEMENTS

The General Plan Elements are an important tool which elected officials can use to provide policy guidance to assist in decision-making. All of the elements of the General Plan are related and interdependent to some degree. However, the Noise Element is most closely related to the Land Use, Housing, Circulation, and Open Space Elements as shown in Figure 1.

A major objective of the Noise Element is to provide guidelines to achieve noise-compatible land use. The Land Use and Noise Elements are, therefore, closely related. The Noise Element, by identifying noise-sensitive land uses and establishing compatibility guidelines for land use and noise, will influence

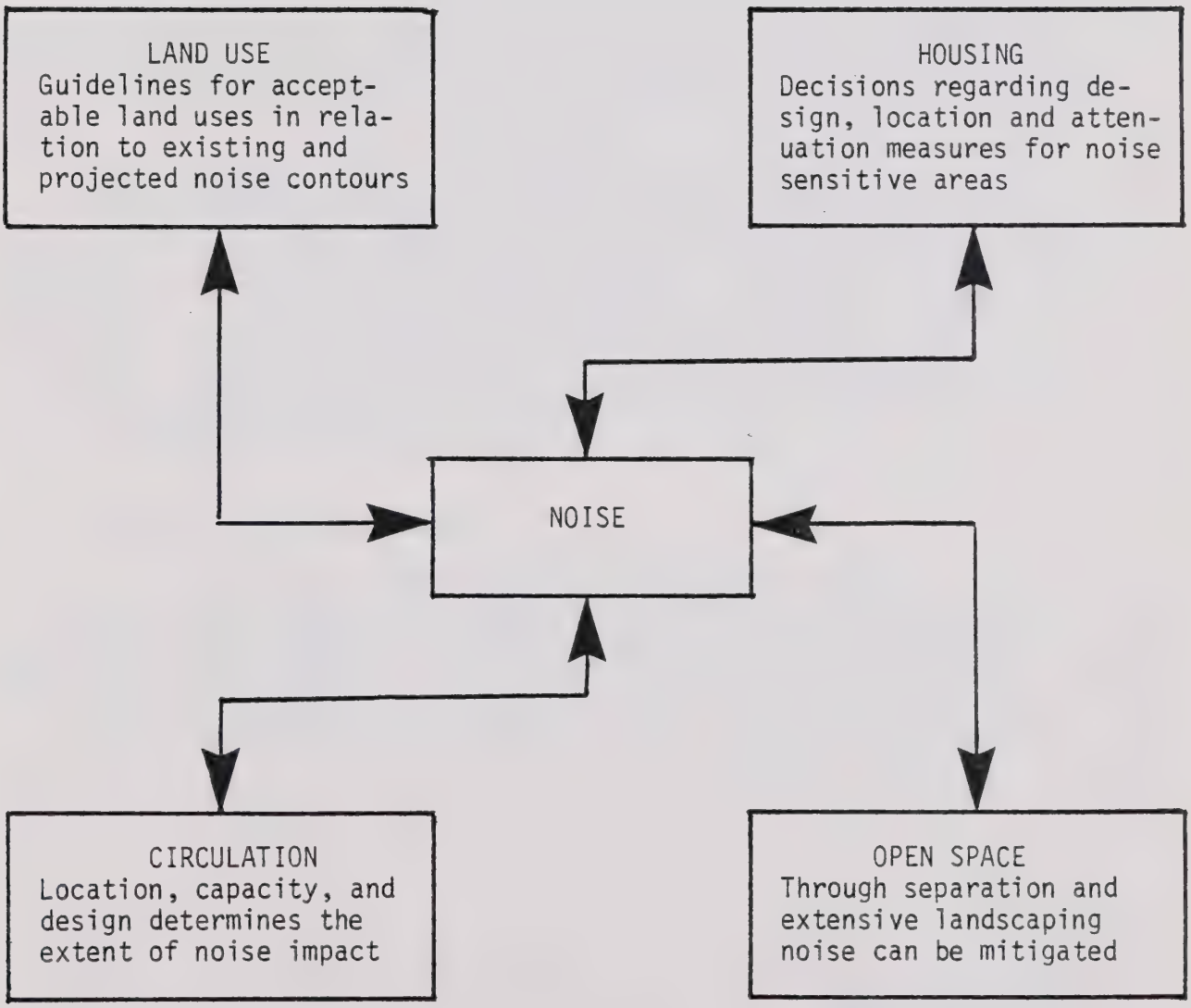


Figure 1. NOISE ELEMENT INTERACTION WITH OTHER ELEMENTS

the general distribution, location, and intensity of future land use. Effective land use planning can alleviate noise problems.

Residential areas are one of the most noise-sensitive land uses. Therefore, the Housing Element is directly affected by the Noise Element. The Housing Element policies and programs should include safeguards against noise intrusion. Implementation of land use/noise compatibility guidelines can reduce noise impacts in residential locations. In addition, proper noise mitigation measures during construction of housing can guard against adverse noise impacts.

The circulation system within a city is one of the major sources of noise. Therefore, the existing and future circulation system identified in the Circulation Element will greatly influence the noise environment. The circulation routes such as freeways and highways, along with truck routes, should be located as to minimize noise impact upon noise-sensitive land use. The location and design of new transportation facilities and possible mitigation of noise from existing and planned facilities will greatly influence the overall noise environment within the City.

Since noise can adversely affect the enjoyment of quiet activities in open space, the Noise Element is also closely related to the Open Space Element. Conversely, open space can be used as a noise buffer between incompatible land uses. This technique can reduce community noise levels and also provide usable open space for recreation.

E. FINDINGS

1. Community Attitudes

To assess community attitudes towards noise, a Noise Management Program Questionnaire was distributed to the City of Oxnard City Council, Planning Commission, General Plan Study Committee, and the chairpersons of the Neighborhood Councils. A total of 105 questionnaires were distributed. The responses indicated that noise is a low priority problem in the City and that most noise annoyances were related to motor vehicles.

2. Community Noise Survey

A community noise survey was performed in August and September, 1977 at 128 locations within the City of Oxnard and its planning area to assess the existing noise environment. A detailed report of the noise measurement survey is found in Volume II.

The community noise survey identified a variety of noise sources in a relatively small geographical area. Intersection locations (reference 50 feet from centerline of near travel lane) range from 62 to 80 L_{eq} in the day with an average of 67 L_{eq} at night. Neighborhood areas range from 49 to 73 L_{eq} with an average of 59 L_{eq}. Both areas drop at night by 10 dB. Railroads, airport and industrial sites produce noise levels substantially in excess of the ambient in their absence. In general, Oxnard's neighborhood areas are noisier that most cities of comparable size. The reason for this occurrence is the high density of high noise sources (i.e.; freeway, railroad and airport) as well as the mixed land use.

3. Goal Policies, and Program

The City of Oxnard has specified an overall goal and policies in the General Plan. Policy 5 directly relates to the noise environment and states: "The City should seek opportunities to offer a better physical, social, and economic environment." With this policy in mind, a noise goal and policies for the City of Oxnard are set forth to provide guidelines for the effective use of the Noise Element of the General Plan. The Noise Element goal reflects broad aims and constitutes a formal statement of the quality of life desired by the citizen. The policies identify courses of actions to achieve that goal and serve as a connecting link between the goal and individual programs designed to attain the desired end. The goal for the Noise Element is described below.

Goal

To protect the health, safety, and general welfare of City residents by mitigating existing noise impact areas and establishing noise-compatible land use for future developments.

The goal of the Noise Element for the City of Oxnard can be achieved through the adoption of policies and the implementation of programs to mitigate noise throughout the City. These policies and programs are discussed in Section IV.

4. Noise Control

The focus of a noise management program is the Community Noise Ordinance. Its assumptions and procedures will guide all land use planning and abatement techniques. Accordingly, Section V first describes the noise ordinances and then explains how the recommended noise ordinance is to be used in land use planning and noise abatement programs.

The planning standards for the City of Oxnard are based upon the standards specifically indicated in the City's Noise Ordinance and were developed by the National Environmental Health Association. These standards are described in Section V. The standard for an active or noisy residential zone is 60 dBA during the daytime and 55 dBA during the nighttime. The noise standard should not be exceeded for a cumulative period of more than 30 minutes in any hour.

5. Land Use Planning

A local jurisdiction has the greatest opportunity to achieve noise control and abatement through judicious land use and transportation planning. Integration of land use/noise compatibility planning requires that all land development procedures reflect the standards of the Noise Ordinance and land use planning guidelines. Well defined noise compatibility guidelines influence all actions from the Land Use Element to a building permit.

The Noise Ordinance is directed at controlling noise from stationary sources. The land use planning guidelines are directed at transportation sources. Transportation sources noise regulation has been pre-empted by the state and Federal government (e.g. highways, railroads, airports). Since the Oxnard CNEL noise contours are based on transportation sources, guidelines were developed to minimize land use incompatibility from transportation sources.

6. Noise Abatement

Enforcement of the Noise Ordinance is accomplished by a rigorous complaint, monitoring, and citation program except where control noise standards is preempted by State or Federal regulations.

The Federal and State goverments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and various other adverse physiological, psychological, and social effects associated with noise. Federal government preempts control of noise emissions from aircraft, railroads, and interstate highways.

The State of California has also adopted noise standards in areas of regulation not preempted by the Federal government. State standards regulate noise levels of motor vehicles and motor boats, establish noise impact boundaries around airports, regulate freeway noise affecting classrooms, set noise insulation standards and establish noise planning standards.

In the absence of sufficient Federal and State enforcement, the City of Oxnard can only recognize the noise eminating from these activities, incorporate these values into the designation of noise zones and the analysis of land use compatibility, and attempt to provide sound attenuation.

7. Noise Enforcement Procedures

Enforcement of a noise control program in Oxnard will necessitate a substantial community commitment. Assistance from many City departments and considerable expenditures of time and funds is required. Sound measurement equipment will either need to be bought or leased and personnel trained to operate it, or this service should be contracted through the County. Community leaders will need to spend considerable time and be faced with delicate tradeoffs between noise reduction and other community priorities.

II. NOISE CHARACTERISTICS

A. THE NATURE OF NOISE

Noise is commonly defined as unwanted, annoying sound. It is a pollutant which lowers the quality of life and detracts from the enjoyment of urban living. At sufficient levels, noise can cause annoyance, speech interference, sleep disturbance, psychological distress, physiological stress and hearing loss. Such noise levels may already exist in some areas of Oxnard.

The most immediate noise problems occur in the buildings people occupy - their homes and places of work. Apart from indoor noise sources, motor vehicles, as a group, are the most pervasive contributors to urban noise. Aircraft, however, which are not the most pervasive noise generators, produce the most aggravated community annoyance reactions. Other significant noise sources include factories, railroads, powered gardening equipment, stereo sound amplifiers, musical instruments, power tools and air conditioners.

Most of the noise problems encountered could be mitigated through the application of simple preventive measures, including:

- Reduction of noise at the source.
- Modification of the path of the noise with the aid of baffles and screens.
- Reduction of noise at the receiver with various types of insulation.

One very effective mean of controlling noise is to control the growth and distribution of population through wise land use planning practices. In this way, residential areas can be separated from freeways, airports and noisy businesses.

Sound is created when an object vibrates and radiates part of its energy as acoustic pressure or waves through a medium such as air, water, or a solid. The ear, the hearing mechanism of humans and most animals, receives these sound pressure waves and converts them to neurological impulses which are transmitted to the brain for interpretation. The combination of the ear and brain results in a perception of sound that may be different from the actual sound: loud sounds may seem quieter and quiet sounds may seem louder. Sounds may be perceived as loud, soft, noisy, quiet and high- or low-pitched. These subjective terms are all relative and do not convey technical information about the sound.

There are two parameters that are used technically to describe simple sounds.

- Amplitude - Amplitude is measured in units of decibels, abbreviated dB. The amplitude of a sound is a measure of the pressure or force that a sound can exert. Subjectively, we say a sound is louder if it has an amplitude larger than another sound. Thus, the amplitude of sounds can be described either in terms of measurable magnitude in dB or in relative terms of loudness.

- Frequency - The unit of frequency, Hertz (Hz), means cycles per second and refers to the number of times that the acoustic pressure (amplitude) peaks in each sound. Subjectively, a sound that has more cycles per sound is higher pitched. High-pitched sounds are produced by a rapidly vibrating sound source and, conversely, low-pitched sounds are from a more slowly vibrating source.

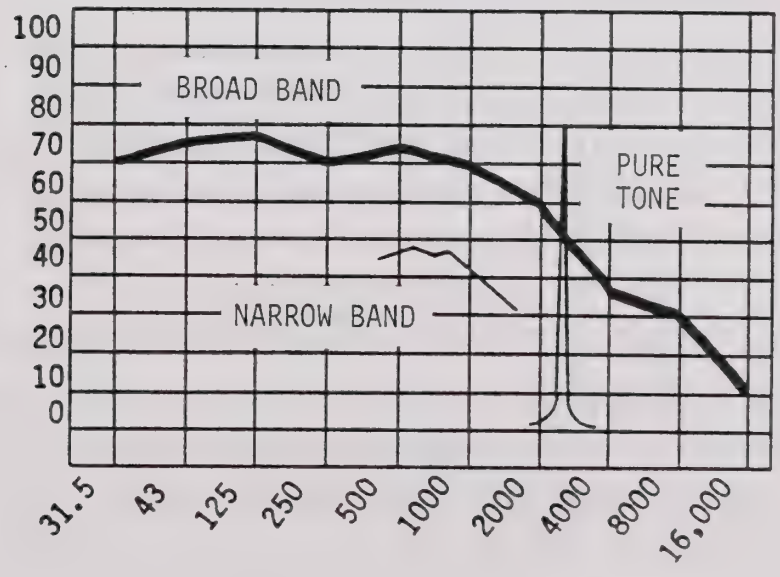
Sounds encountered in community noise may be differentiated on the basis of the range of the frequencies that make up the sound, the number of occurrences of the sound or its periodicity, and the onset of the sound.

The range of the frequencies of a sound can vary from only one frequency (known as "pure tone") to a sound containing a wide range of frequencies, known as "broad band" or "wide band." The periodicity of a sound can be continuous or steady state, repeated at a certain rate of "intermittent," or may occur only once. Finally, the "onset" or beginning of a sound may be gradual or sudden and sharp. Based on these categories, five types of community sounds may be defined:

- Steady Wide Band Sound - This is a continuous sound composed of a large range of frequencies. The onset may either be slow or sudden. Air moving through air condition ducts is an example of steady wide band sound.

- Steady Narrow Band Sound - This sound is the same as steady wide band sound except that it is a continuous noise composed of a small range of frequencies, or a single frequency or "pure tone." A circular saw cutting through a piece of wood is an example of steady narrow sound. Figure 2 portrays the difference between steady narrow band wide band, and pure tone sound.

Figure 2. NARROW BAND, WIDE BAND AND PURE TONE SOUNDS



Source: Noise Element of the General Plan, prepared by Ventura County for the City of Oxnard, October 1974.

- Intermittent Sound - Intermittent sounds may have wide or narrow frequency ranges or be of a "pure tone," but unlike the first two types of sounds, they occur several times during a given period. The sound may occur at random or at a constant rate but not continuously. The onset of intermittent sound is gradual rather than sudden. The fly-overs of aircraft from a busy airport are examples of intermittent sound.

- Impulsive Sounds - These are differentiated from intermittent sounds by their sudden onset and very short duration. Generally, an impulsive sound is defined as lasting for one second or less and beginning with a sudden increase in sound pressure. A gunshot or a car backfiring is an example of this type of sound.

- Repeated Impulsive Sound - This is a sound which has the characteristics of both impulsive and intermittent sound. It has the onset characteristics of an impulsive sound (sudden rise in air pressure) and the repetitiveness of an intermittent sound. Riveting at construction sites is an example of a repeated impulsive sound.

Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale was devised to relate noise to human sensitivity. The A-weighted dB (dBA) scale performs this compensation by discriminating against frequencies both above and below 1,000 Hz in a manner approximating the sensitivity of the human ear. The basis for comparison is the faintest sound audible to the average, young, male, human ear at the frequency of maximum sensitivity.

Doubling the sound pressure of a noise source causes the decibel rating to be increased by only 6 dB due to the logarithmic nature of the noise scale. However, due to nonlinearities in the mechanism of the human ear, a sound must be nearly 10 dBA higher than another to be judged twice as loud. It follows that a sound of 20 dBA is four times as loud, and 30 dBA is eight times as loud.

Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud). The average level of conversation ranges from 60 to 80 dB. Sound becomes discomforting at 120 dB and physically painful above 140 dB. Examples of various sound levels are shown in Figure 3.

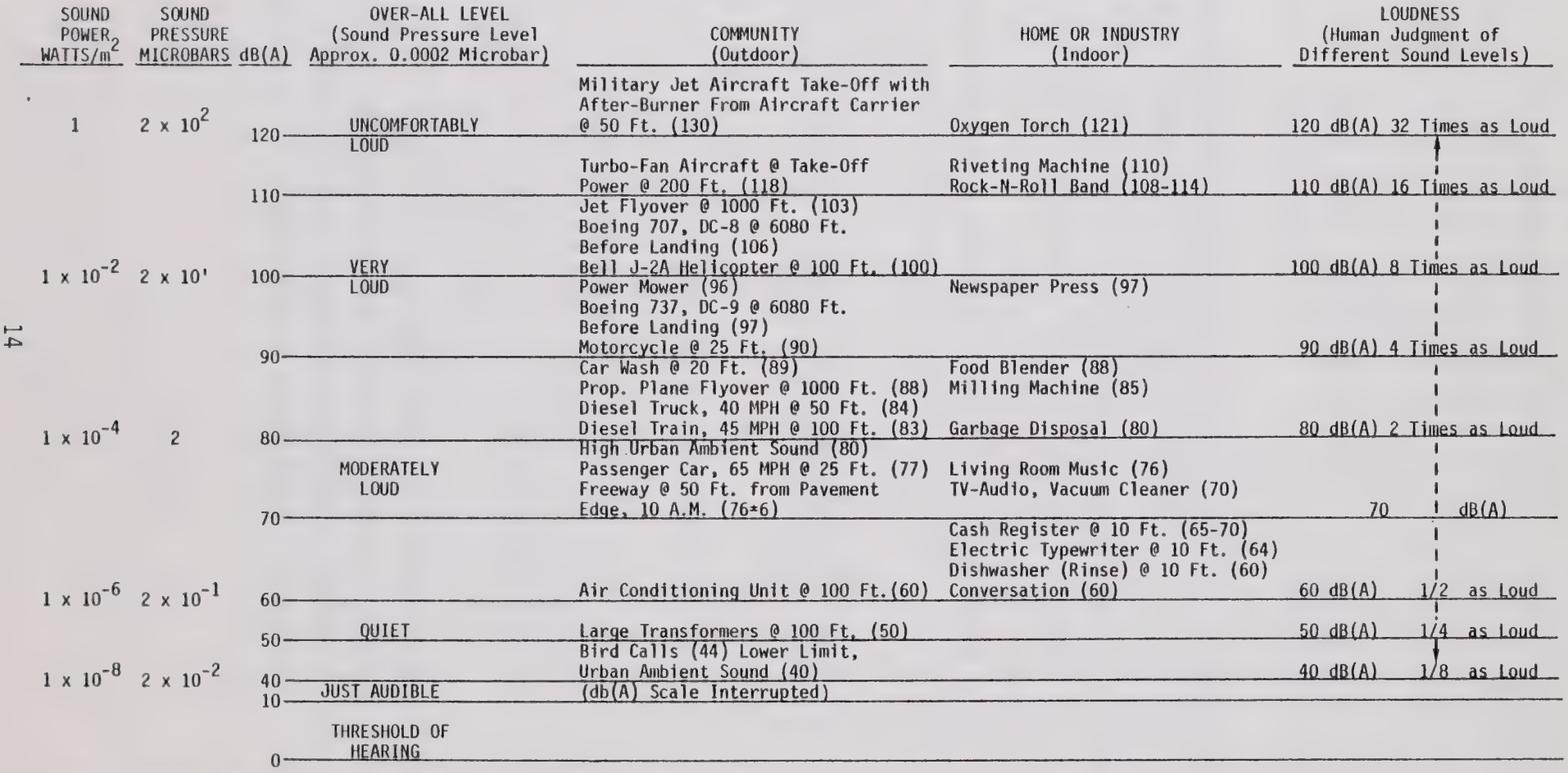
B. NOISE PROPAGATION

Any community noise problems may be divided into three separate parts; the noise source, the noise transmission path, and the receiver. These elements may be independent but are usually dependent to some degree. The output of a noise source may be, in some cases, dependent upon both the path and the receiver. For example, a person (source) will raise his voice if he is aware that his listener (receiver) is hard of hearing. Figure 4 represents the transmission of sound from a source to a listener. The solid arrows represent the transmission path. The broken lines indicate reflection of sound waves.

Figure 4. NOISE TRANSMISSION

The transmission path from the source to the receiver has distinct and significant effects upon the characteristics of the sound reaching the receiver. Physical structures interfere with the path of sound waves. Examples of such structures are walls, berms, and certain types of trees and hedges, as well as topography. The influence of a structure may be accidental, or it may be intentional, such as the use of insulation materials deliberately inserted between the source of sound and the receiver to reduce the intensity of the sound wave or to change the spectral content. Physical structures either produce a reflection of the sound wave or absorb some of the energy.

Figure 3. SOUND LEVELS AND LOUDNESS OF ILLUSTRATIVE NOISES IN INDOOR AND OUTDOOR ENVIRONMENTS
(A-Scale Weighted Sound Levels)



Source: Adapted from Melville C. Branch and R. Dale Beland, Outdoor Noise in the Metropolitan Environment, published by the City of Los Angeles, 1970, p. 2, and Ventura County, Noise Element of the General Plan for the City of Oxnard, 1974, p. II-5.

The exact amount of attenuation depends on a variety of factors. With structures such as walls, berms and trees, the amount is the result of the density and height of the structure as well as its distance from the source and the receiver. Attenuation of the sound wave passing through absorptive materials is largely a result of the mass of the material. In denser materials, more noise loss takes place. Resonant methods of absorption are usually dependent on the design of arrays of small hollow enclosures (cavities) which are tuned to certain frequency ranges.

In the urban environment, it is very difficult to make precise predictions of the effects of structures without detailed information about both the structures and the topography in which they are situated. In communitywide noise environment models, it is not practical to do a microscopic analysis of the noise levels. The Planning Department's Noise Assessment Manual contains background information to compute the effects of walls and exterior to interior noise reduction.

C. NOISE RATING SCALES

Several rating scales have been developed for the measurement of community noise. These account for:

- The parameters of noise that have been shown to contribute to the effects of noise on man.
- The variety of noises found in the environment.
- The variations in noise levels that occur as a person moves through the environment.
- The variations associated with the time of day.

The predominant rating scales now in use in California are: Energy Mean Noise Level (L_{eq}), Day-Night Average Sound Level (L_{dn}), and Community Noise Equivalent

Level (CNEL). L_{eq} is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. L_{dn} is similar to L_{eq} but applies a weighting factor which places greater significance on noise events occurring at night (10:00 p.m. to 7:00 a.m.) than during the day (7:00 a.m. to 10:00 p.m.). CNEL is similar to L_{dn} but with weighting factors placed on two time periods (evening, 7:00 p.m. to 10:00 p.m. and night, 10:00 p.m. to 7:00 a.m.).

D. STATISTICAL NOISE TERMINOLOGY

Noise from many sources varies over a period of time so that the noise level is not constant. Under conditions of time-varying noise, sound becomes a statistical phenomenon which can be described properly only by statistical parameters. Over the years, this fact has led to some confusion in the use of acoustical terminology. The terms most frequently used are "ambient," "background," "median," "residual," "mean," and "model."

Ambient noise is the surrounding or pervading noise environment at a location. Therefore, it does not refer to the noise levels from any given source, but represents a merging of all sources. The background noise in an environment refers to the noise level present after all identifiable sources have been removed from consideration. Background noise fluctuates less with time than does ambient noise. This term is more descriptive of conditions that exist at a site than is the sound level value at any given point in time which may include noise from a transitory source.

Other statistical terms in common usage are the "mean" noise level (the average of the value of all events occurring at a location) and the model noise level (the most frequently occurring noise level at a location). Thus, the description of sound at a location can be complex. When a noise level is given for a particular location, it is important to know what statistical characteristic is described by that noise value.

In recent years, qualitative terms have been replaced by statistical descriptions of ambient noise. Noise values are given statistically in percentiles. For example, the 90th percentile value existing at a measurement location is the noise value exceeded 90 percent of the time. It is abbreviated by the term L_{90}. Percentile values which have come into common use to describe the characteristics at a location include L_{90}, L_{50}, and L_{10}. The L_{90} value is called the "residual" noise level. The L_{50} value is also called the "median" noise level. The L_{10} value represents the peak or near peak noise level.

E. HUMAN RESPONSE TO NOISE

The effects of noise on people range from annoyance and inconvenience to temporary or permanent hearing loss. The Environmental Protection Agency (EPA) has stated that some 180 million people are significantly impacted by noise, half of whom are exposed to levels that can damage hearing or otherwise affect health.(1)* Noise is not only detrimental to well-being, but also is costly. The World Health Organization has estimated that over $4 billion is spent by United States industry each year for noise-related absenteeism, reduced efficiency, workman's compensation claims, and mental illness.(2)

One of the greatest problems in noise analysis is that of relating noise exposure to health and welfare, and determining adequate maximum noise levels for the protection of well-being. Although there has been some dispute in the scientific community regarding the detrimental effects of noise, a number of general conclusions have been reached:

- Noises of sufficient intensity <u>have caused</u> irreversible hearing damage.

- Noises <u>have</u> produced physiological changes in humans and animals that in many instances has not resulted in adaption.

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*Numbers in parenthesis denote References (Section VII).

- The effects of noise are cumulative and, therefore, the levels and durations of noise exposure must be taken into account in any overall evaluation. The recognition of this fact has been translated into legislation specifying limits of total permissible noise exposure in industrial settings.

- Noises can interfere with speech and other communication.

- Noise can be a major source of annoyance by disturbing sleep, rest and relaxation.

- When community noise levels have reached sufficient intensity, social action has occurred to reduce their effects. This has often taken the form of creating new organizations (or using existing ones) to press for regulation by means of laws, ordinances and standard.(3)

The EPA has identified noise levels considered requisite to protect health and welfare with an adequate margin of safety. These levels are summarized in Table 1. The L_{eq} (24) values represent energy averages over a 24-hour period. For the protection against hearing loss, 96 percent of the population would be protected if noise levels are less than or equal to an L_{eq} (24) of 70 dB.

It is generally accepted that people react differently to the same noise. In part, this can be explained by the inherent differences between individuals. This differential reaction, particularly to annoying noises, may also be explained by a number of factors listed below:

- Individual sensitivity of person exposed.
- Tonal quality of the noise.
- Periodicity of the noise.
- Loudness of the noise.
- Previous community experience to noise exposure, if any.
- Time of day when noise occurs.
- Season of year when noise occurs.

Table 1. SUMMARY OF NOISE LEVELS IDENTIFIED AS REQUISITE TO PROTECT PUBLIC HEALTH AND WELFARE WITH AN ADEQUATE MARGIN OF SAFETY[a]

EFFECT	LEVEL	AREA
Hearing Loss	L_{eq} (24) $\leq$ 70 dB	All areas
Outdoor activity interference and annoyance	$L_{dn} \leq$ 55 dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	L_{eq} (24) $\leq$ 55 dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} \leq$ 45 dB	Indoor residential areas
	L_{eq} (24) $\leq$ 45 dB	Other indoor areas with human activities such as schools, etc.

[a] An L_{eq} (24) is the equivalent steady noise level which in a given period of time (24 hours), contains the same noise energy as the intermittent noise sources during the same time period.
A Day-Night Level (L_{dn}) is a noise index which is weighted between 10:00 p.m. to 7:00 a.m. to account for the increased noise sensitivity during the nighttime hours. An L_{dn} value is approximately equivalent to a CNEL.

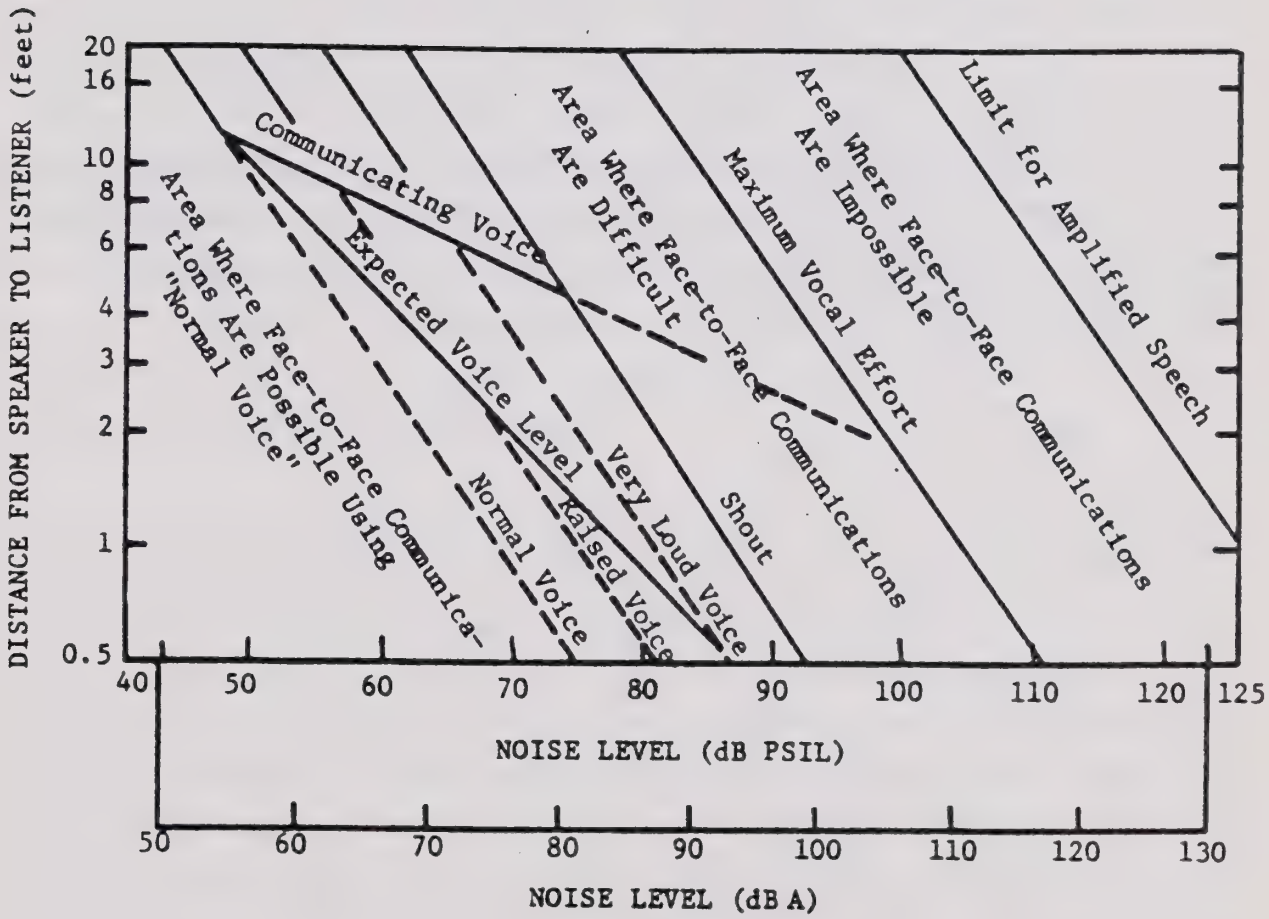
- Information content of the noise.
- Background noise.
- Type of onset of the noise.
- Attitude toward the noise.
- Variability of noise level.
- Duration of noise.
- Ability of the recipient to control the noise.
- Anticipation of the noise.
- Visibility of the noise source.

Interference with speech communication is one of the most common effects of noise. Although individuals do have the selective ability to distinguish one particular sound over others (e.g., an ambulance siren on a noisy boulevard), there are finite limitations to this ability. Masking occurs when unwanted sounds make desired sounds inaudible (e.g., jet aircraft making outdoor communications impossible). This masking effect explains why certain sounds such as the ticking of a clock are perceptible in relatively quiet environments and unnoticeable in noisier ones and, conversely, why extremely loud noise sources such as motorcycles appear less intrusive in a noisy urban setting (70 dBA) than in a quiet residential community (40 dBA).

The implications of background noise on interpersonal communications are substantial. This process involves culturally acceptable communicative distances and speech levels. The prescribed American social norm is approximately 4-1/2 to 5 feet for a normal conversation. If background noise levels increase, speakers are required either to infringe on this space, to raise their voice level, or to cease communication. The choice of any of these alternatives is culturally unsatisfactory and represents a disruption to interpersonal relationships.

The simple A-weighted sound level (dBA) is a useful index of the masking ability of a noise and compares favorably with Perceived Speech Interference Level (PSIL) as can be seen on Figure 5. The A-weighting process emphasizes the median frequencies, as do the various PSILs. However, in contrast to most PSIL schemes, A-weighting does not ignore the lowest frequencies where speech

Figure 5. SPEAKING LEVELS REQUIRED WHEN TALKING OVER VARIOUS DISTANCES AND BACKGROUND NOISE LEVELS



Voice level and distance between talker and listener for satisfactory face-to-face speech communication. An example for interpreting this chart: Jet aircraft cabin noise is roughly 80 ±2 dBA. An 80 dBA in their expected (raised) voice level, seat mates can converse at 2 feet and, by moving a little, can lower their voices to normal level and converse at one foot. To ask the stewardess for an extra cup of coffee from the window seat (4 feet), one would need to use his very loud communicating voice.

becomes intelligible. Some people believe that they are not affected by high levels of background noise; however, most are not consciously aware of their adoption of nonverbal communications through gestures, posture, and facial expression as compensating devices for normal communication.

In addition to health and annoyance effects, high noise levels cause economic losses. Findings indicate that traffic noise has a negative and statistically significant effect on property values when background noise levels (L_{10}) are exceeded by peak levels (L_{90}) which are 10 dBA higher. For suburban areas, marginal capitalized damages were found to be $58 per property per dBA increase in noise from L_{10} to L_{90}. Property located near an airport noise contour of 75 CNEL was found to be worth 10 percent less than a property located in a 55 CNEL. However, if noise impacted residentialproperty is changed into commercial or industrial uses, property values may increase based upon demand, especially around airports.(4)

III. NOISE ENVIRONMENT

A. COMMUNITY ATTITUDES

1. Community Survey

To assess community attitudes towards noise, a Noise Management Program Questionnaire was distributed to the City of Oxnard City Council, Planning Commission, General Plan Study Committee, and the chairpersons of the Neighborhood Councils. A total of 105 questionnaires were distributed. The responses indicated that noise is a low priority problem in the City and that most noise annoyances were related to motor vehicles.

Of the 57 respondents, only 4 viewed environmental problems as the major problem in the City. However, noise ranked first (with incompatible land use) as the major environmental problem. Fifty-three respondents were affected by noise at least sometime in their daily life and 19 were affected often. Infrequent but loud noise described the noise environment in the neighborhoods of half the respondents. However, almost 25 percent indicated that they lived in quiet neighborhoods. Trucks/motorcycles were the most often cited major noise disturbance in the home. Loud parties/barking dogs, aircraft, and general traffic accounted for most of the other disturbances. Most annoyances occurred equally during the day and night except loud parties and barking dogs which were identified as a nighttime problem, and aircraft operations which were mentioned more during the day than the night. When asked which noise source was the most annoying, the bulk of respondents specifically indicated trucks and motorcycles. Other responses of interest included aircraft sirens, and trash trucks. A copy of the questionnaire and a summary of responses is presented as Appendix A.

2. Noise Complaints

Records of noise complaints are handled by a number of City and County agencies. Reports of noisy parties and vehicles made to the Police Department are handled as disturbing the peace or disorderly conduct.(5)* Industrial or commercial noise is handled by the Building and Safety Department. Approximately three or four complaints concerning construction noise are received each year; and a building inspector is assigned to evaluate the problem with the construction supervisor.(6)

Noise standards have been placed on industrial and commercial development requiring a use permit. These standards were simply a specified dBA level measured at the property line.(7) In response to complaints in these developments, the Building and Safety Department has made measurements at a steel plant, a lumber mill, a scrap metal shredder, and a drilling site. A noise-suppressing berm was reconstructed around the drilling site, the lumber mill was found to be within the limits of its use permit, and the steel plant and shredder were found to be noisy only at specific times.(8)

Both the City and the County handle complaints and enforcement regarding noisy animals. The Oxnard Zoning Ordinance prohibits loud animals including dogs, roosters, and goats. Ventura County Animal Control Division received approximately 60 complaints of barking dogs between February and August 1977. The County sends a form letter to the dogs' owners informing them of the complaint and the possibility of a $25.00 to $50.00 fine. The Oxnard Building and Safety Department, upon receipt of a written complaint, sends a building inspector to warn owners of loud animals and then sends a written notice of action taken to the complainant. Approximately ten such actions are taken by the City each year.(9)

Noise from aircraft occasionally generates complaints to Point Mugu Naval Air Station and the Ventura County Airport. The few complaints which Point Mugu receives from the City of Oxnard residents stem principally from sonic booms.

*Numbers in parenthesis denote References in Section VII.

Residents of a new mobile home development south west of Ventura County Airport complained after moving in, but discontinued doing so after a few months. Neither Point Mugu nor the Ventura County Airport appears to have a steady record of noise complaints. Aircraft noise complaints appear to be a sporadic reaction to occasional noisy flights.(10)

The Community Relations Department which serves as City ombudsman also handles complaints dealing with noise. Many complaints originate from agricultural equipment near residential areas. Early morning crop dusting and plowing are frequent offenders. Off-road vehicles, especially motorcycles generate frequent complaints from residents near open county areas. Railroad noise generates complaints mainly from older areas of the City. Trucks and speeding cars create many disturbances along Oxnard Boulevard. Many of the large trailer trucks traveling Highway 101 circumvent the weigh station by detouring via Oxnard Boulevard. This contributes to the high noise levels on this major street. The traffic lights on this roadway are also timed so as to require a burst of speed in order to make the green light. This adds to the high noise levels. The Community Relations Department normally handles complaints via telephone and has not as yet, referred a case for a formal complaint. (11)

B. COMMUNITY NOISE SURVEY

A community noise survey was performed in August and September, 1977 at 128 locations within the City of Oxnard and its planning area to assess the existing noise environment. A detailed report of the noise measurement survey is found in Volume II.

The community noise survey identified a variety of noise sources in a relatively small geographical area. Intersection locations (reference 50 feet from centerline of near travel lane) range from 62 to 80 L_{eq} in the day with an average of 67 L_{eq} at night. Neighborhood areas range from 49 to 73 L_{eq} with an average of 59 L_{eq}. Both areas drop at night by 10 dB. Railroads, airport

and industrial sites produce noise levels substantially in excess of the ambient in their absence. In general, Oxnard's neighborhood areas are noisier than most cities of comparable size. The reason for this occurrence is the high density of high noise sources (i.e.; freeway, railroad and airport) as well as the mixed land use.

The results of the community noise survey has been divided into discussions by City section and specific noise sources.

South Central - Channel Islands to Hueneme, Ventura to San Simeon.

Daytime L_{eq} values in neighborhood areas typically range from 56 to 61 dBA. The average was 58 dBA. The lowest levels (L_{90}) lie in a narrow range of 47 to 52 dBA. As expected, L_{10} levels show a greater spread.

Intersection L_{eq} values fall in a range of 66 to 73 dBA. The average was 72 dBA since most locations were near the high end of the scale.

Southeast - San Simeon to Rice, Hueneme to 5th.

The area is only sparsely developed. The neighborhood locations are limited and L_{eq} values range from 56 to 64 dBA with an average of 58 dBA.

Intersections range from 68 to 73 dBA with an average of 72 dBA. Site 19 was near the mobile home park at Pleasant Valley and the Pacific Coast Highway and has a 68 L_{eq} reading.

Nighttime samples at sites indicated an average 16 dBA reduction at intersections. Neighborhood locations are anticipated to drop the same amounts. On average, then, the neighborhoods would experience daily noise levels of 56 CNEL. Intersections (30 to 50 feet from the near travel lane) would be an average 71 CNEL in this area.

Southwest - 5th to Port Hueneme Harbor, Ocean to Ventura.

This area has been divided into the area near the ocean and to the east. The area near the ocean has a considerably lower density of population and limited through roadways. Daytime L_{eq} values in the neighborhood ranged from 51 to 53 dBA. Intersections ranged from 60 to 66 dBA. The State park was an average 64 dBA.

Examination of the night samples indicates no consistent downward shift of noise at night at the survey sites. On this basis, we estimate neighborhoods at an average 58 CNEL and intersections at 70 CNEL.

In the eastern area neighborhood location L_{eq} values range from 49 to 65 dBA with an average of 71 dBA. Nighttime samples show a typical 10 dBA drop in neighborhoods and 5 dBA at the intersection. The neighborhoods are expected to read 59 CNEL and the intersection 74 CNEL.

Northwest - Doris to Santa Clara River, Oxnard to Ventura.

This area is largely vacant west of Ventura. Neighborhood locations ranged from a low of 51 to a high of 64 L_{eq} with an average around 58 L_{eq}. Intersections were typically 64 to 67 L_{eq} west of Ventura and 69 to 64 L_{eq} east of Ventura. Ventura County Airport is in this section and is considered separately.

Northeast - Oxnard to Rice, 5th to Route 101.

The northeast area is largely the Colonia area with a small residential area up near Route 101. Daytime neighborhood sites in the Colonia were 51, 58, and 67 L_{eq}, respectively. The levels tend to rise toward 3rd Street, and with the lowest north of Colonia Road. Intersections ranged from 68 to 74 L_{eq} in the daytime. The neighborhood site (5) near Route 101 registered 67 L_{eq}. Remeasurement at night indicated 48 L_{eq} or a 14 dBA

drop. Intersection locations in this section dropped 10 dBA which we estimate can be applied to the Colonia. The nighttime intersection readings would typically read 72 CNEL in this area, or an equivalent of the daytime L_{eq} value. The area near Route 101 computes at 65 CNEL.

Del Norte - North Route 101.

The Del Norte area is largely undeveloped. The three neighborhood sites read from 51 to 61 L_{eq}. Locations near Route 101 read 69 L_{eq} and locations at intersections in the undeveloped areas ranged from 63 to 65 L_{eq}. Nighttime readings near the freeway indicate a 7 dBA decrease, and in the outlying areas the reductions are 15 dBA. On this basis, the areas away from streets are calculated at 50 CNEL, near the intersection at 60 CNEL, and near the freeway 60 CNEL.

Central - Ventura to Rice, Channel Island to Doris.

The central area contains both strictly residential neighborhoods and neighborhoods with mixed commercial/industrial and residential. The neighborhoods range from 60 to 65 L_{eq} in the daytime. Nighttime levels drop about 5 dBA on average. Intersections range from 70 to 75 L_{eq}. Nighttime levels were only 1 to 2 dBA lower at the sample periods. On this basis, we rank the neighborhoods west of Oxnard Boulevard at an average 65 CNEL, and the intersections at an average 78 CNEL.

Commercial - (Shopping Centers).

Most commercial areas are included in the intersection measurements. Some were selected that did not fit into that category. Sites were located at Esplanade (68), and the center at Saviers and Channel Island Boulevard. On the interior of the Esplanade Shopping Center, the reading was a relatively low 62 CNEL, lower than a typical intersection and higher than a typical neighborhood. At the other center the reading was

expressly for compressor noise (Site 28A). This read 67 L_{eq} at 50 feet from the compressor with a maximum of 72 dBA.

Industrial

Nine industrial sites were measured. The results are catalogued in Table 2.

Table 2. INDUSTRIAL LOCATIONS

SITE	LOCATION	L_{eq}(DAY)	% TRUCKS
36A	Richmond-Wooley	68.3	25
30B	Commercial-Oxnard	69.9	22
43A	Oil Pump	70.9	NA[a]
94A	New Union Ice	71.7	5
113A	Near Commercial-Wooley	73.4	13
118	Jet Scrap Company	66.4	NA
119	McWane and Acturus	76.9	NA
119A	Kaiser Steel	75.3	NA
120	S. Calif. Edison-Oxnard	64.6	NA

[a]Not applicable for this measurement.

Four of the sites were located along streets and reflect both the contribution of traffic, the industries and some railroad switching. Five of the locations were selected for specific sources as noted in Table 2. All the latter sources are characterized by almost continuous type operations. With the exception of the Edison plant, the other specific sources have very high continuous levels.

Railroads

Railroads noise occurred at five of the measurement sites as part of the normal survey process. The maximum noise levels at these sites are shown in Table 3.

Table 3. MAXIMUM NOISE LEVELS FROM TRAINS AT FIVE COMMUNITY SITES

SITE	MAX. dBA	SOURCE	CNEL
13	86	Ventura County R.R.	37[a]
38	89, 98	SPRR	68[b]
39	92	SPRR	61
93	78	SPRR on Oxnard Road	47
95	74	SPRR on Oxnard Road	43

[a]CNEL calculated from data supplied by Ventura County Railroad at one train per day.

[b]CNEL calculated from operations data supplied by SPRR for 11 trains from 7 a.m. to 10 p.m. and five from 10 p.m. to 7 a.m. and events recorded at the site.

Additionally, a site was selected in the Esplanade Shopping Center, and extensive monitoring of trains was performed. Eight events were recorded. The results are listed in Table 4.

Table 4. TRAINS AT 100 FEET FROM TRACK ESPLANADE PARKING LOT

EVENT	NO. OF ENGINES	TYPE	dBA MAX.	DURATION (SECONDS)	SENEL
1	4	Freight	93	197.5	109.8
2	1	Freight	88	25.5	99.4
3	2	Freight	94	31.1	104.7
4	6	Freight	94	197.6	108.6
5	4	Freight	97	102.8	109.7
6	2	Passsenger	90	33.6	104.7
7	1	Freight	91	29.1	100.0
8	5	Freight	91	94.7	107.4
Average			93.1	89.0	107.0

Note: Calculated from SPRR estimate of 15 trains per day from 7:00 a.m. to 10:00 p.m. and 5 per day from 10:00 p.m. to 7:00 p.m.

C. NOISE CONTOURS

The 1977 noise contours for the City of Oxnard are based on traffic, railroad movements, and airport activity described in Appendix B. The methodology used for computing the noise contours is presented in Volume 2, Section II. The noise contours are in the Community Noise Equivalent Level (CNEL) noise indices. The CNEL is a method of representing in a single number the combined effect of a daily noise exposure. The CNEL value computed at any point is the sum of the decibel values of the sound, with corrections for time of day and averaged over 24 hours. The equation used for variables is shown below.

Mathematically, the CNEL is computed by the following equation:

$$CNEL = \overline{SENEL} + 10 \text{ Log } W(N_d + 3N_e + 10N_n) - 49.4$$

where: $\overline{SENEL}$ = Average Single Event Noise Exposure Level (SENEL) value in a 24-hour period of all aircraft operations. This values combines both intensity and duration into a single measure of aircraft flyover noise.

W = The total volume of aircraft in a 24-hour period.

N_d = Percentage of aircraft events from 7:00 a.m. to 7:00 p.m.

N_e = Percentage of aircraft events from 7:00 p.m. to 10:00 p.m.

N_n = Percentage of aircraft events from 10:00 p.m. to 7:00 a.m.

The weighting factors 3 and 10 are employed to account for increased sensitivity to noise in the evening and nighttime periods.

The noise contours represent lines of equal noise exposure, just as the contour lines on a topgraphic map are lines of equal elevation. The contours represent a visualization of the geographic variation of the distribution of noise, and display the relationship between the source, noise, and the environment in

which the noise contours exist. The noise contours presented should be used as a guide for land use planning with respect to the noise environment.

The noise contours for 1977 are shown in a separate document. The largest noise contours are a result of the Southern Pacific Railroad, Ventura Freeway, and Ventura County Airport operation. A tabulation of the number of persons impacted by major noise sources in the City of Oxnard is shown below. Traffic on roadways throughout the City are the major noise source. A total of 11,050 people are within the 60 CNEL. The total population impacted by roadways is actually larger since the roadway contours already within the railroad noise contours are not included.

Persons Impacted by Noise Source

SOURCE	CNEL 60	CNEL 65
Roadways[a]	11,050	7,200
Ventura Freeway	520	260
Highway 1	290	130
Ventura County Airport	50	15
Southern Pacific Railroad	860	120
Oxnard Boulevard		
North of West 5th	790	120
West 5th, East of Saviers	70	-
Total	12,770	7,725

[a]Roadway totals do not include those roadway contours already within railroad noise contours.

The ten roadways which impact the most people in the City of Oxnard are listed below:

J Street continuing to Hobson Way and H Street
C Street
Ventura Road
Channel Islands
West Hemlock
Saviers Road
Gonzales Road

Pleasant Valley
Wooley Road
Victoria Avenue

These roadways account for almost 90 percent of the 60 CNEL roadway noise impact within the City of Oxnard.

The next major noise source in the City of Oxnard is the Southern Pacific Railroad line on Oxnard Boulevard north of 5th West. There are 790 people within the 60 CNEL contour. Traffic on Ventura Freeway and Highway 1 are also major noise sources. Ventura County Airport and the Southern Pacific Railroad line on West 5th, east of Saviers impact relatively few people.

Stationary noise sources are also a cause of noise impact and annoyance. A number of industrial sites were previously discussed in Section III.B. The major industrial sites ranked in order of noise levels include; Arcturus Drop Forge, Kaiser Steel, Jet Scrap Company, and Southern California Edison plant Ormond Beach.

The future noise environment was assessed for 1990. The noise contours for 1990 are presented in a separate document. Again the largest noise contours are a result of the Southern Pacific Railroad, Ventura Freeway, and Ventura County Airport operations. The railroad contours are essentially the same due to similar operations and noise levels. Ventura County Airport noise contours increase in size as a result of the increase in operations from 218,000 in 1977 to 285,000 in 1990.

The future noise contours do not include the East-by-Pass. The decision was based upon projections for the time-phasing of the East-by-Pass and the availability of traffic data. If the East-by-Pass were constructed, noise levels would increase substantially along the route. The East-by-Pass would encourage growth in the northeast portion of the City. Comprehensive planning should be undertaken along the route to avoid land use/noise incompatibility.

IV. GOAL, POLICIES, AND PROGRAMS

The City of Oxnard has specified an overall goal and policies in the General Plan. Policy 5 directly relates to the noise environment and states: "The City should seek opportunities to offer a better physical, social, and economic environment." With this policy in mind, a noise goal and policies for the City of Oxnard are set forth to provide guidelines for the effective use of the Noise Element of the General Plan. The Noise Element goal reflects broad aims and constitutes a formal statement of the quality of life desired by the citizen. The policies identify courses of actions to achieve that goal and serve as a connecting link between the goal and individual programs designed to attain the desired end. The goal for the Noise Element is described below.

Goal

To protect the health, safety, and general welfare of City residents by mitigating existing noise impact areas and establishing noise-compatible land use for future developments.

The goal of the Noise Element for the City of Oxnard can be achieved through the adoption of policies and the implementation of programs to mitigate noise throughout the City. These policies and programs are discussed below.

Policy 1 - Establish standards and criteria that will protect the public health, safety, and welfare of Oxnard citizens.

The most effective implementation program would be the adoption and enforcement of a Noise Ordinance that is applicable to all residential, commercial and industrial zones within the City.

The Ordinance should be enforced by the Building and Safety, Planning, and Police Departments. The Noise Ordinance enforcement program should be provided with the necessary funding and expertise to ensure its effective enforcement.

The Noise Ordinance should consider, but not be limited to, such noise problems as amplified music, motorcycles and other mechanical noise problems.

Policy 2 - Monitor all levels of governmental efforts at noise abatement.

Noise does not respect jurisdictional boundaries. More stringent Federal and State mechanisms for the control of large-scale mobile polluters (e.g.; aircraft, automobiles) should be encouraged. Current laws and regulations governing such noise sources are discussed in Section V.3.

The City should maintain close coordination with the agencies discussed in Section V.3. along with the Ventura County Environmental Health Agency so that the City can introduce the community's goal and policies with other agencies in their decision-making processes, and to assess subsequently the impact of those decisions. Liaison should also be maintained with these agencies in order to evaluate and obtain information on beneficial abatement programs and settle interjurisdictional disputes arising from noise impact.

The City should monitor the latest governmental developments in the field of noise abatement and control and provide for their implementation wherever possible into City programs.

Policy 3 - Integrate noise considerations into the community planning process to prevent noise/land use conflicts. All elements of the General Plan should be reviewed for inclusion of possible revisions giving recognition to noise level/land use relationships.

To some degree, all the elements of the General Plan are related and interdependent. The Noise Element is closely related to a number of elements of the General Plan such as Land Use, Circulation, Housing and Conservation and Open Space. The City should review these related elements and revise them where necessary to protect the noise environment of Oxnard. The City's Land Use Element does not adequately consider the issue of airport, freeway, and railroad noise sources. Low-density residential is currently planned for areas immediately east of Ventura County Airport.

This property lies in the approach path and is adversely affected by noise. The area immediately east of the airport and Ventura Road should be planned for noise compatibility. Similarly, undeveloped property adjacent to Ventura Freeway and rail lines should be planned for noise compatibility. Specifically, undeveloped property between Vineyard Avenue and Rose Avenue adjacent to the Ventura Freeway should be planned for noise compatibility.

The circulation system is one of the major sources of noise. Noise exposure will thus be a decisive factor in the location and design of new transportation facilities and the possible mitigation of noise from existing facilities in relation to existing and planned land use.

The City of Oxnard's Circulation Element does not reflect the major impact it has on the noise environment in the City of Oxnard. All major transportation routes should be designed to minimize noise impact.

The Housing Element considers the provision of adequate sites for new housing and standards for the housing stock. Since residential land use is among the most noise-sensitive land uses, the noise exposure information provided in the Noise Element must be considered when planning the location of new housing. Also, State law now requires special noise insulation of new multi-family dwellings constructed within the 60 dB (CNEL or L_{dn}) noise exposure contour. This requirement may influence the location and/or insulation requirements of this housing type.

Excessive noise can adversely affect the enjoyment of recreational pursuits in designated open space. Thus, noise exposure levels should be considered when planning for this kind of open space use. Conversely, open space can be used as a tool to buffer noise sources from sensitive land uses through setback and landscaping. Open space designation can also effectively exclude other land uses from excessively noise areas.

Policy 4 - Develop an implementation program to monitor noise and achieve a desirable noise environment.

The success or failure of the City of Oxnard Noise Management program can only be determined by periodic community noise surveys. These surveys can determine the effectiveness of existing programs and assist in the refinement of existing noise management programs or the development of new programs. Every 5 years a major community noise survey should be undertaken by either the Ventura County Environmental Health Agency or a qualified consultant. This will monitor the effectiveness of the City's Noise Management Program.

Policy 5 - Identify and employ mitigation measures to reduce the impact of noise on noise-sensitive land uses.

The use of noise abatement measures adjacent to all major sources of noise pollution such as Ventura Freeway, the rail lines, and Ventura County Airport should be encouraged. The use of noise abatement measures should also consider the esthetic qualities of the environment where feasible.

The City should also consider noise generation in the specifications for purchase of City equipment. The noise generated by construction equipment is a major annoyance and should be considered in all City purchases.

Policy 6 - Provide opportunities for citizen input regarding noise problems.

The success of the Noise Ordinance depends on the voluntary compliance of the citizenry. Periodic inspection and checks are all that can be

implemented without prohibitive municipal costs. Municipal inspection of violations should be in response to complaints and inquiries of citizens. If this response can be linked with a reliable system of communication permitting citizens to report noise violations readily, the effectiveness of the noise control program will be increased.

The adoption of a mechanism for a noise information dissemination service to create citizen awareness and support for noise control programs is essential. The City should prepare a noise information pamphlet for distribution. This would enable citizens to gain a general background in noise. The pamphlet should also describe the procedure to register noise complaints.

V. NOISE CONTROL

The focus of a noise management program is the Community Noise Ordinance. Its assumptions and procedures will guide all land use planning and abatement techniques. Accordingly, this section will first describe the noise ordinance and then explain how the ordinance is to be used in land use planning and noise abatement programs.

A. COMMUNITY NOISE ORDINANCE

A successful noise management program must be integrated from the General Plan level down to the issuing of a violation citation. A consistent policy oriented towards a viable implementation procedure ensures that the goals of the program will be achieved. The Noise Ordinance presented below reflects the efforts and experiences of many persons and jurisdictions involved in noise control. Based on the concept of "Noise Receptor Use Standards," the Ordinance maintains a constant focus for both the development process and the abatement process.

Early Noise Ordinances and many current ones, rely on broad definitions of annoyance and disturbance and require civil nuisance suits for enforcement. Later Ordinances relied on quantitative emissions from specific sources to indirectly protect the receptor. More recent efforts involve relating noise to ambient levels and enacting noise performance zoning standards. While these techniques have many advantages, they also have serious drawbacks. Noise receptor use standards retain many of the advantages of those techniques while minimizing most of the disadvantages and represent the latest generation of noise control techniques. Very simply, noise receptor use standards regulate the noise which may encroach certain types of land use regardless of source.

This concept is more easily enforceable than any other strategy, and is appropriate for the City of Oxnard.

1. Background

Oxnard has had few noise standards or regulations. Commercial and industrial uses requiring a use permit have had limits placed on noise emissions on a case-by-case basis. The Oxnard planning staff has recommended such limits to the Planning Commission based on U.S. Department of Housing and Urban Development standards as measured on the property line. For example, a condition for a use permit for an industrial activity would be that noise may not exceed a certain dBA level measured on the property line. Violators would be subject to revocation of the use permit. The Planning Commission and City Council have occasionally altered the staff recommendations according to particular circumstances. The animal noise ordinance mentions only a continual disturbance as the criterion for enforcement. Another Oxnard Ordinance directed at auctions states only that neighbors shall not be disturbed. All three of these control techniques attempt to regulate the source of the noise.

The quantitative or qualitative control of specific sources has several limitations. First, it does not permit regulations of unforeseen nuisances. Second, it does not allow reduction of noise levels concommitant with new abatement technology. Third, it is unfair to the operator who must locate his activity close to the property line. Fourth, it does not consider cumulative noise effects of several sources or the relationship of the noise source to ambient noise. Lastly, qualitative control allows for discretionary enforcement.

To overcome these deficiencies, other strategies are available. The quantitative over ambient stragegy regulates noise sources respective to the given environment in which they are to operate. This is accomplished by determining the existing ambience of various zones (e.g., according to streets or other geographical reference points), then setting the criteria for a violation at a specified decibel level over the predetermined background noise (e.g., 5 dBA). For example, if the ambient levels of a commercial zone and a residential zone were 65 dBA and 55 dBA respectively, a power lawn mower impacting both property

lines at 60 dBA would be cited as a violation of the ordinance in the residential zone but not in the commercial. The League of California Cities model Noise Ordinance referenced in Phase 1 of the Oxnard Noise Element uses this strategy.

The approach has some merit in light of the fact that human perception of noise is determined in part by the masking affect of higher sounds over lower ones. However, the advantages of this method of accounting for the relative impact of noise is outweighed by some substantial costs in its total effectiveness. First, if the community already has an excessively high ambient noise level, allowing an additional 5 dBA for the determination of violation will only add to the existing noise problem. Second, permitting an added 5 dBA over the background noise (e.g., 60 dBA) will invariably result in many sources being operated above the designated ambient noise level but just under the criteria for a citation (e.g., at 63 dBA). This obviously will result in a slow but steady rise in the overall community noise level, or what has sometimes been called "creeping ambience." Hence, it is clear that with the enactment of such an Ordinance, the tendancy will be for the situation to grow progressively worse rather than better, which ironically would be opposite to the very intent of the Ordinance.

Another strategy utilizes zoning performance standards. Noise performance zoning standards are a method to regulate land use by environmental effects rather than by types of activities. Hence, rather than having "laundry lists" describing what sources may and may not exist in a particular land use zone, the designation of permissible uses would be determined by the measurable effects of their operation. It should be emphasized that performance standards are not primarily for the regulation of noise disturbances, but rather for the location of activities (mainly industrial) into zones with comparable noise standards. Thus, many nuisance problems can be simply avoided by strategic location of potentially harmful activities. For example, the problem of an industry with an excessive amount of noise can be easily ameliorated by placing it out of earshot in an area with a similar ambient level.

A noise performance standard ordinance can offer the community real benefits if it is properly enforced. Performance standards are quantitative by design, nondiscretionary, and most importantly, they are flexible. Unlike a noise source ordinance, performance standards can readily accept the introduction of new and unpredicted products because it is based on the level of emissions from zones rather than specific sources. Thus, it does not need periodic revisions to incorporate unforeseen sources or an inherently vague "general noise" provision.

Unfortunately, these standards are not as ideal as they may appear. This method, like others, is directed at the procreator of noise rather than the recipient. Standards are enacted specifying what level of noise may emanate from a particular zone, with no explicit consideration given to the impact on the zone receiving the pollutant.

At first glance, these two may seem coterminous; however, this is not so. If the performance standard for an industrial zone is 75 dBA, it may be tolerable for a contiguous commercial zone, but it would clearly be unacceptable for an adjacent quiet residential area.

This deficiency may be circumvented if different performance levels are promulgated based upon the activity they impact. Thus, the performance standards for industrial noise impacting industrial uses might be 70 dBA, with 65 dBA for its commercial neighbors and 55 dBA for residential zones. In effect, each land use distinction would have specific emission standards for every other land use it would invade (i.e., higher or lower levels respective of land use noise sensitivity). Therefore, the performance standard Ordinance can become a cumbersome, complex, and indirect method to protect noise recipients.

In recent years, receptor use standards have been experimented with in various municipal and state governments. This strategy is aimed directly at protecting the noise recipient by regulating the amount of noise entering his land use zone rather than indirectly attempting to insure his well-being by controlling the emission levels from a source or zone.

There are a number of advantages to this kind of approach. First, levels can be directly related to health and annoyance criteria. For example, the currently suggested EPA maximum limit for the prevention of noise annoyance to an outdoor recipient is 55 L_{dn}. An upper limit of 70 dBA (L_{eq}) assures protection against minimal hearing loss. A community can confidently insure the protection of its citizens from these levels by enacting a receptor standard of 55 L_{dn} in noise-sensitive land use. Second, the implementing ordinance designates specific standards for the citation of a noise violation, thus insuring nonarbitrary administration and enforcement. Third, because it governs the impact of noise to the recipient regardless of the noise source, the strategy assures the immediate regulation of new sources without amendment to the Ordinance. Lastly, property is the simple geographic measurement point for a violation. Thus, it is closely related to the location where the nuisance is perceived rather than at an arbitrary distance.

The most serious problems with any local noise control stragegy are pre-existing sources and competing economic and social priorities. Variances and exemptions are a necessary part of any viable ordinance. However, providing an equitable compromise between noise generator and noise receptor is a difficult and delicate task. Amortization provisions and various procedures can be incorporated into a systematic program to gradually reduce noise without undue hardships. Time limits and operating restrictions can be negotiated to satisfy all parties.

2. Recommended Noise Ordinance

The model Ordinance which best accommodates the problems and issues discussed above is the Model Community Noise Control Ordinance developed by the National Environmental Health Association (NEHA). This model establishes equitable quantitative maximum permissible noise levels affecting residential, commercial and industrial areas. These noise limits are compatible with the intent of controlling excess noise and its effects on people. The model Ordinance establishes an objective method and procedure for investigation, measurement, evaluation and enforcement to achieve uniformity in application and obtain compliance with the standards. The standards are based on actual field studies

conducted by various independent associations and government sources, as well as research reported in scientific literature. The Ordinance can be applied in controlling annoying stationary noise sources encountered in complaint situations. In addition, the standards can be used in land use planning when a proposed development may radiate noise to adjacent parcels.

The Ordinance, which is based on time-weighted noise exposure limits, may be readily converted and specified in terms of criteria used to develop noise contours. The standards can then define the noise impacted area in the form of contours similar to the Noise Exposure Forecast, Composite Noise Rating Contours, Community Noise Equivalent Levels, and Equivalent Day-Night.

The model represents the latest state of the art and is the work of many persons involved in day-to-day implementation and enforcement of noise control. It is recommended that the Planning Commission and City Council study this model ordinance, make modifications where appropriate for the City of Oxnard, and adopt it in its general form.

The NEHA model Ordinance is based on the establishment of four noise zones, each of which relates to particular land uses. Allowable exterior noise levels are established for each zone and nothing or no one is allowed to cause these levels to be exceeded. Similar interior noise levels are also established for all residential use. Procedures for variances and delays are provided. Guidance on use of the ordinance is available. A complete copy of NEHA Community Noise and Vibration Control Ordinance modified to reflect the desires and needs of the City of Oxnard is included in Appendix C.

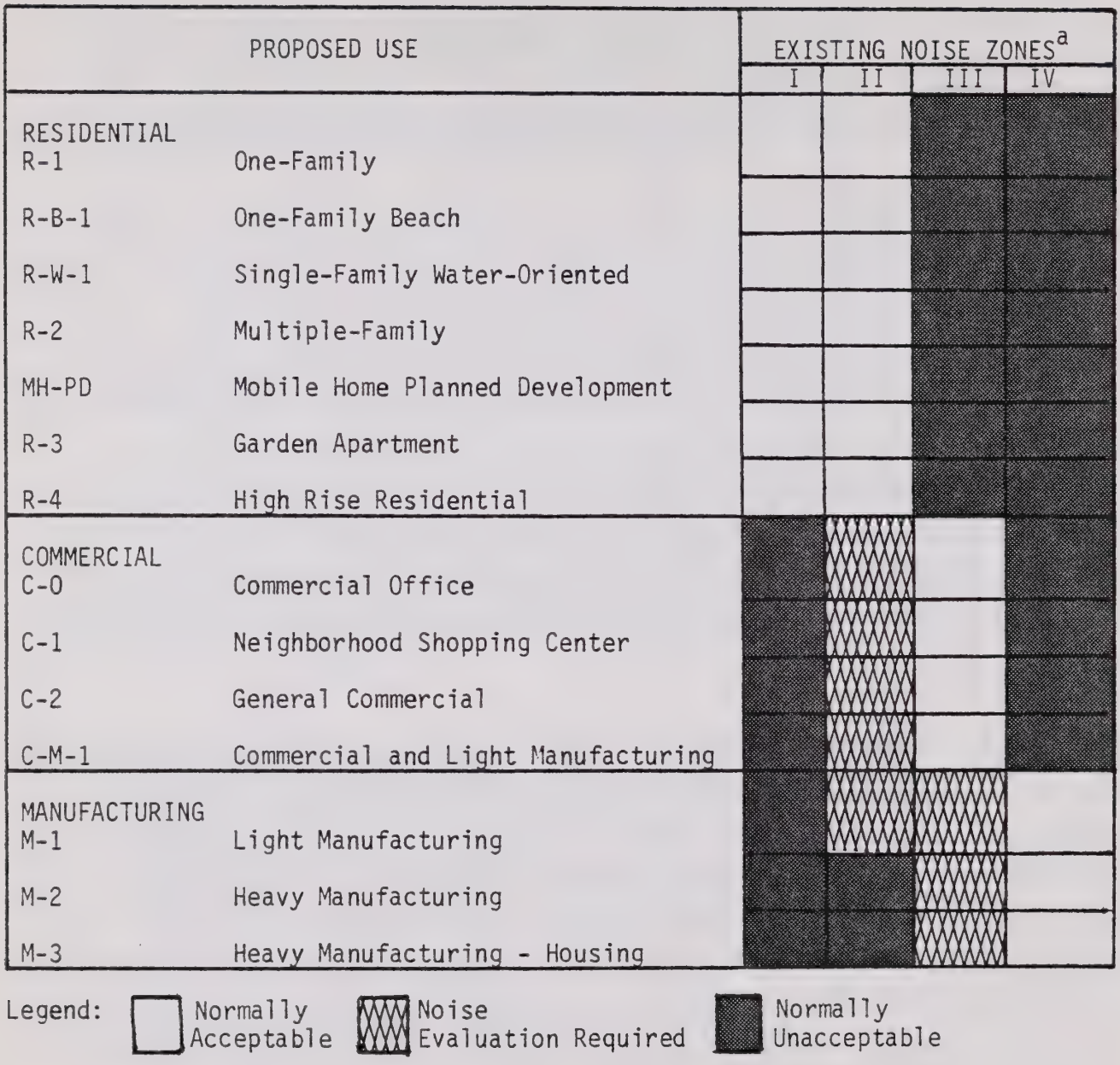
The City of Oxnard's Noise Ordinance standards are shown in Table 5.

Table 5. NOISE ORDINANCE STANDARDS

ALLOWABLE	NOISE ZONES			
	I Quiet Residential	II Active Residential	III Commercial	IV Industrial
Exterior Noise Level				
10:00 p.m. to 7:00 a.m.	50 dBA	55	60	70
7:00 a.m. to 10:00 p.m.	55 dBA	60	65	70

The standard for an active or noisy residential zone is 60 dBA during the daytime and 55 dBA during the nighttime. The noise standard should not be exceeded for a cumulative period of more than 30 minutes in any hour. These standards, however, only apply to stationary noise sources, sources not regulated by state and Federal agencies, and sources on the project site which may radiate noise.

The mapping of the City according to noise zones greatly enhances the effectiveness of the noise control program. The Community Noise Survey and other surveys (e.g., the Point Mugu AICUZ) have identified the existing noise environment and the noise contours are presented in Appendix E. Noise zones are determined by the existing noise environment and examination of zoning. For example, all zoned residential property within a 60 CNEL contour is considered active residential and Noise Zone II. All zoned residential property outside the 60 CNEL contour is designated quiet residential (Noise Zone 1) and new developments should meet that criteria. Property zoned commercial falls within Noise Zone III while zoned manufacturing and industrial property is categorized as Noise Zone IV. Based on the noise contours, zoning, and the Noise Ordinance standards all developments can be evaluated with regards to noise impacts. The Noise Ordinance land use/noise compatibility matrix is shown in Figure 6.



[a]Noise Zone I - Residential (Quiet)
Noise Zone II - Residential (Active)
Noise Zone III - Commercial
Noise Zone IV - Manufacturing or Industrial

Figure 6. NOISE ORDINANCE LAND USE/NOISE COMPATIBILITY MATRIX
(Applicable to Stationary Sources)

Noise and land use compatibility were determined by considering both noise receptor and general characteristics. A proposed development would be incompatible if it created or was exposed to excessive noise. For example, a variance to put a commercial use in a residential district would be compatible from a noise standpoint if the noise generation did not exceed the standard for residential areas. On the other hand, a residential unit in a commercial district would be incompatible because the unit may be exposed to excessive exterior noise. Even if the commercial district did not exceed the residential standard at the time of the variance, the residential unit would still be incompatible according to the matrix because the commercial area has the potential to exceed the residential standard. Of course, the Noise Ordinance allows for exceptions and mitigating agreements, as reflected by the use of the term "normally" in the matrix. In this manner, new development can be evaluated for its noise compatibility with the surrounding community.

B. LAND USE PLANNING

1. Guidelines

A local jurisdiction has the greatest opportunity to achieve noise control and abatement through judicious land use and transportation planning. Integration of land use/noise compatibility planning requires that all land development procedures reflect the standards of the Noise Ordinance and land use planning guidelines. Well defined noise compatibility guidelines influence all actions from the Land Use Element to a building permit.

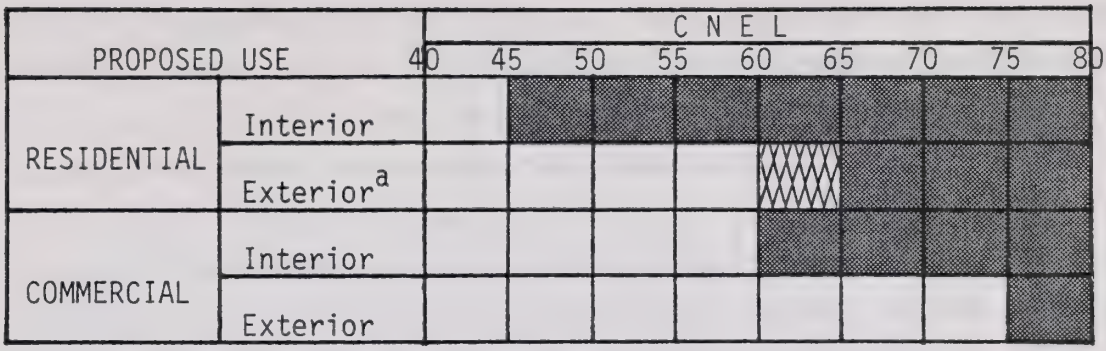
The Noise Ordinance discussed previously is directed at controlling noise from stationary sources. The land use planning guidelines which follow are directed at transportation sources. Transportation sources noise regulation has been pre-empted by the state and Federal government (e.g. highways, railroads, airports). Since the Oxnard CNEL noise contours are based on transportation sources, guidelines were developed to minimize land use incompatibility from transportation sources.

Such guidelines provide the flexibility to consider both technological feasibility and economic viability, in addition to hearing loss and reliable speech communication and sleep. Most importantly, planning guidelines provide a preventative approach to noise pollution. They can be used to review new land use and redevelopment action in relation to compatibility with noise standards.

Planning guidelines for residential and commercial property are shown in Figure 7. The guidelines are in terms of CNEL which relates directly to the noise contours found in Appendix E and F. The exterior and interior noise guidelines are provided. The ability of various structures to attenuate or reduce exterior noise is discussed later (see Table 12). In the event any portion of a residential site exceeds 60 CNEL on the exterior or 45 CNEL on the interior from transportation noise sources, an applicant would be required to provide mitigation measures to comply with the guidelines.

2. Individual Projects

Noise evaluation of all development projects is a necessary part of environmental assessment procedures, and the Environmental Division of the Oxnard Planning Department has the responsibility to ensure that the land use/noise compatibility guidelines and the Noise Ordinance standards are adequately addressed. Individual zone changes, subdivisions, use permits, and similar discretionary projects thus have a built-in mechanism for considering noise compatibility. However, ministerial actions have the potential to create new noise problems. Building permits and business licenses must be monitored by the issuers departments for potential noise-generating uses. Most commercial and manufacturing uses require some sort of use permit. In order to ensure complete noise compatibility planning, all commercial and manufacturing uses should require a use permit, wherein a noise assessment is mandatory. Similarly, business license applications should inquire about noise to determine if new businesses will create noise in existing structures. In this manner, potential noise problems resulting from individual projects can be screened and prevented.



LEGEND:

Normally Acceptable

Noise Evaluation Required[b]

Normally Unacceptable

[a]Exterior residential space is defined as: any place on the lot of a single family detached home; all private open-space (including balconies and patios) of planned unit developments; and all portions of the required common open space of planned unit developments except those portions at ground level within the required street setback line. Planned VMT development is all development other than single family detached homes.

[b]The noise evaluation must include measures to meet the 65 CNEL exterior and 45 CNEL interior levels.

Figure 7. GUIDELINES FOR LAND USE/NOISE COMPATIBILITY PLANNING (Applicable to Transportation Sources)

3. General Planning

Integration of the Noise Element into the Land Use Element is required by State law and essential to the noise control plan. Land use designations can be evaluated using the standards of the Noise Ordinance and the guidelines for land use/noise compatibility planning in the same manner as they are for individual projects. Proposed uses must be compared with the noise zone map to determine compatibility. If other land use constraints indicate a noise-incompatible use, then mitigation measures are necessary. For example, if vacant land within a Noise Zone III (created by a railroad or airport) is unsuitable for any use other than residential, then the land use element must provide for this by requiring a use permit to ensure sound attenuation. The noise zone map in conjunction with the compatibility matrix, thus becomes a major land use determinant to be balanced and adjusted with other determinants such as access, topography, and soil stability.

Existing noise-incompatible uses present a special problem. Most of the impacted areas described in Section III.D. are residential areas affected by transportation noise and which have been designated as Noise Zone II. This designation reflects the existing land use and the desired noise levels for these areas. Should the formulation of the land use element lead to changing existing land use within the impact areas, then the noise zones can be rearranged to reflect existing noise. On the other hand, if general land use designations remain the same for the impacted areas, then the noise zones continue to reflect desired noise levels, and the noise abatement techniques described later will be applied to the impacted areas.

C. NOISE ABATEMENT

Enforcement of the Noise Ordinance is accomplished by a rigorous complaint, monitoring, and citation program except where control of noise standards is preempted by state or Federal regulations. The following sections detail how the City of Oxnard can 1) augment State and Federal regulations, 2) conduct a local monitoring and citation program, and 3) mitigate specific noise problems within Oxnard.

1. Federal Noise Standards

The Federal and State governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and various other adverse physiological, psychological, and social effects associated with noise. The Federal government preempts control of noise emissions from aircraft, railroads, and interstate highways.

The first Federal efforts regulating noise were issued by the Department of Labor in 1969 establishing noise as an occupational health hazard. As a result, two legislative acts have been enacted that regulate noise from industrial fixed-point sources resulting in hearing loss. The Walsh-Healey Public Contracts Act as amended includes provisions for occupational noise regulations. Failure by a corporation to comply with the established standards may result in the corporation's removal from a list of bidders eligible for Federal contracts.

The Occupational Safety and Health Act (OSHA) of 1970 sets noise exposure standards as shown in Table 6 for all businesses engaged in interstate commerce.

Table 6. PERMISSIBLE NOISE EXPOSURES

DURATION, HOURS PER DAY	SOUND LEVEL dBA
8	90
6	92
4	95
3	97
2	100
1	105

In 1972, Congress enacted the Noise Control Act. This act authorized the Environmental Protection Agency (EPA) to publish descriptive data on the effects of noise and establish levels of noise "requisite to protect the public health and welfare with an adequate margin of safety." These levels are separated into health (hearing loss levels) and welfare (annoyance levels) as shown in Table 7.

Table 7. SUMMARY OF NOISE LEVELS REQUISITE TO PROTECT PUBLIC HEALTH AND WELFARE

EFFECT	LEVEL
Hearing Loss	70 dB[a]
Outdoor activity interference and annoyance	55 dB[b]
Indoor activity interference and annoyance	45 dB[b]

[a]Averaged over a 24-hour period.

[b]Averaged over a 24-hour period with a 10-dB nighttime (10:00 p.m. to 7:00 a.m.) weighting.

The levels are designed to ensure reliable speech communication at about 5 feet in the outdoor environment. The EPA cautions that their identified levels are not standards because they do not take into account the cost or feasibility of the levels. The EPA concludes that 24-hour continuous noise levels should be below 70 dBA to minimize the risk of hearing loss. For outdoor and indoor environments, interference with activity and annoyance will not occur if levels do not exceed 55 dBA and 45 dBA, respectively.

The Federal Highway Administration (FHWA) and the Department of Housing and Urban Development (HUD) are two Federal agencies that have established noise level criteria for various types of land use. The FHWA has established noise standards for land use criteria for use in the planning and designing of highways as shown in Table 8. These standards apply for Federal and State highway projects.

Table 8. DESIGN NOISE LEVEL/LAND USE RELATIONSHIPS

NOISE LEVEL[a]	DESCRIPTION OF LAND
60 (Exterior)	Tracts of land in which serenity and quiet are of extraordinary significance and sever an important public need - i.e., amphitheaters, parks and open space.
70 (Exterior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, picnic areas, recreation areas, playgrounds, active sport areas, and parks.
75 (Exterior)	Developed lands not included in the above categories.
55 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

[a]Noise level may be exceeded 10 percent of the time (L_{10}).

Exterior noise levels apply to outdoor areas which have regular human use and in which a lowered noise level would be of benefit. The noise level values need not be applied to areas having limited human use or where lowered noise levels would produce little benefit. The indoor level relates to indoor activities where no exterior noise-sensitive land use or activity is identified.

HUD has established policies for granting financial support for the construction of residential dwellings in noise-impacted areas as shown in Table 9.

Table 9. EXTERNAL NOISE EXPOSURE STANDARDS FOR NEW CONSTRUCTION

Acceptable	- Does not exceed 45 dBA more than 30 minutes per 24 hours (L_2).
Discretionary	- Normally acceptable - does not exceed 65 dBA more than 8 hours per 24 hours (L_{33}).
Discretionary	- Exceeds 80 dBA 60 minutes per 24 hours (L_4). Exceeds 75 dBA 8 hours per 24 hours (L_{33}).

Any noise environment that exceeds 65 dBA for 8 hours per day is considered normally unacceptable and requires certain measures to reduce noise levels in the living quarters. Also, noise reduction methods need to be presented to the Regional Administrator of the Federal Housing Authority (FHA) for approval before financial assistance or support is granted. Beyond these requirements, HUD personnel at the local level must assess the acceptability of noise exposure in indoor sleeping areas. These areas are considered acceptable if the noise levels:

Interior

> ...do not exceed 55 dBA for more than ... 60 minutes in any 24-hour period (L_4) and do not exceed 45 dBA for more than 30 minutes ... from 11:00 p.m. to 7:00 a.m. (L_6) and do not exceed 45 dBA for more than ... 8 hours in any 24-hour day (L_{33}).

A general comparison of Federal Noise Standards is shown in Table 10. These standards are shown for a maximum recommended per 24-hour period, although levels may be exceeded for shorter periods of time. However, these higher levels must be offset by even quieter levels of noise the remaining period of time.

The Federal government also regulates noise emitted by rail sources. The Department of Transportation Federal Railroad Administration Railroad Emission Compliance Regulation, August, 1977, regulates the total sound emitted by rail sources. These regulations do not, however, apply to horn, whistles, and other warning devices.

Table 10. GENERAL COMPARISON OF FEDERAL NOISE STANDARDS

A-WEIGHTED SOUND PRESSURE LEVEL dBA	MAXIMUM RECOMMENDED DURATION FOR 24-HOUR PERIOD				
	OSHA Industrial Limits	EPA LIMITS		HUD Limits (Exterior)	FHWA Limits (Exterior)
		Health	Annoyance		
45			Indoor	Acceptable	
50					
55			Outdoor		
60					Public Open Space
65				Discretionary	
70		Hearing Loss			Residential, etc.
75					Other Developed Lands
80					
85	Permissible			Unacceptable	
90	Not Permissible			Unacceptable	

In the absence of sufficient Federal enforcement, the City of Oxnard can only recognize the noise eminating from these activities, incorporate these values into the designation of noise zones and the analysis of land use compability, and attempt to provide sound attenuation.

2. State Noise Standards

The State of California has also adopted noise standards in areas of regulation not pre-empted by the Federal government. State standards regulate noise levels of motor vehicles and motor boats, establish noise impact boundaries around airports, regulate freeway noise affecting classrooms, set noise insulation standards and establish noise planning standards as shown in Table 11.

The California Motor Vehicle Code sets operational noise limits for motor vehicles (Section 23130), requires an adequate muffler in constant operation and properly maintained (Section 27150), prohibits the sale or installation of a motor vehicle exhaust system unless it meets regulations or standards (Section 27150.1), prohibits the modification of the exhaust system to amplify or increase the noise above that of the original system (Section 27151), prohibits the sale of new vehicles exceeding the noise limits (Section 27160), and sets noise limits for the operation of off-highway motor vehicles (Section 38280) as shown in Table 11. Police and traffic officers enforce this code.

The California Department of Aeronautics has set noise standards governing airports which operate under a valid permit issued by the department. The regulations are designed to create cooperation among airport proprietors, aircraft operators, local governments, pilots, and the department in efforts to diminish noise. The regulations do this by controlling and reducing the noise in communities in the vicinity of airports.

State noise insulation standards are outlined in two separate documents. The primary noise insulation regulator is the 1973 edition of the Uniform Building Code (UBC), Appendix Chapter 35. A secondary document related to the implementation of the UBC is the California Administrative Code, Title 25, Chapter 1, Subchapter 1, Article 4, which requires acoustical insulation in areas subjected

Table 11. STATE OF CALIFORNIA NOISE STANDARDS

Description	Noise Standards (dBA Values at 50 Feet unless noted Otherwise)		
Operation of vehicles at posted speeds:	Effective Date	35 MPH or less	Over 35 MPH
1. Motorcycle		85	86
2. Vehicle with a GVW of 6000 lb. or more (or combination)	Before 1/1/73	88	90
	After 1/1/73	86	90
3. Any other motor vehicle and any combination of motor vehicles towed by such vehicle		76	82
Sale of new vehicles			
1. Motorcycles manufactured	Before 1970		92
2. Motorcycles, other than motor driven cycles manufactured	After '69, Before '73		88
	After '72, Before '75		86
	After '74, Before '78		80
	After '77, Before '88		75
	After '87,		70
3. Vehicle with a GVW of 6000 lb. or more	After '67, Before '73		88
	After '72, Before '75		86
	After '74, Before '78		83
	After '77, Before '88		80
	After '87		
4. Any other motor vehicle	After '67, Before '73		86
	After '72, Before '75		84
	After '74, Before '78		80
	After '77, Before '88		75
	After '87		
Noise level limits for the operation of off highway motor vehicles	Any vehicle manufactured on or after 1/1/72 before 1/1/73		92
	after 1/1/73 before 1/1/75		88
Establish Noise Impact Boundary around airports	(in CNEL units at ground level)		
New Airports	65 dB		
Existing large airports	Before 1/1/76	80 dB	
	After 1/1/76	75 dB	
	After 1/1/81	70 dB	
	After 1/1/86	65 dB	
Existing small airports	Before 1/1/85	70 dB	
	After 1/1/85	65 dB	
Noise Insulation Standards	After 8/22/74 (in CNEL units) 45 dB interior 60 dB or greater requires analysis		

CNEL = Community Noise Equivalent Level

to 60 dB or greater in order to maintain an annual interiors level of 45 dB in any habitable room of a multiple dwelling unit.

The State has also established noise/land use planning standards in Section 65302(g) requiring a noise element to the general plan:

> . . . (g) A noise element in quantitative, numerical terms, showing contours of present and projected levels associated with all existing and proposed major transportation elements. These include but are not limited to the following:
>
> (1) Highways and freeways,
> (2) Ground rapid transit systems,
> (3) Ground facilities associated with all airports under a permit from the State Department of Aeronautics.

These noise contours may be expressed in any standard acoustical scale which includes both the magnitude of noise and frequency of its occurrence. The recommended scale is sound level A, as measured with A-weighting network of a standard sound level meter, with corrections added for the time duration per event and the total number of events per 24-hour period.

Noise contours shall be shown in minimum increments of 5 decibels and shall be continued down to 65 dBA. For regions involving hospitals, rest homes, long-term medical or mental care, or outdoor recreational areas, the contours shall be continued down to 45 dBA.

Conclusions regarding appropriate site or route selection alternatives or noise impact upon compatible land uses shall be included in the general plan.

The State, local, or private agency responsible for the construction or maintenance of such transportation facilities shall provide to the local agency producing the general plan, a statement of the present the projected noise levels of the facility, and any information which was used in the development of such levels.

In addition, the California Council of Intergovernmental Relations(CIR) has issued guidelines in the preparation of noise elements that both modify and extend the content as prescribed by the legislative mandate.

The City of Oxnard does enforce State regulations through the Police and Building and Safety Departments. Currently, the Police Department responds to complaints of loud vehicles and issues equipment citations to force violators to make necessary modification. Enforcement of off-road vehicles and "dirt-bike" regulations depends largely on complaint activity. Occasionally an officer will stop a blatently loud vehicle and issue such a citation. Oxnard police officers have not had formal training to identify noise regulation violations. However, there is a daily 30-minute training period preceding squad meetings which could be used for familiarizing officers with various noise regulations. Police training officers could use sound meters to demonstrate unacceptable noise levels and urge patrol officers to be more aware of violations. If necessary, hand-held sound meters can be carried in patrol cars. Police officers would issue citations for infrequent noise violation. The Building and Safety Department would be responsible for long-term noise monitoring of possible violations. Since traffic sources have been cited as the major noise irritant in Oxnard, police awareness and enforcement of vehicle noise regulations would promote a quieter community environment.

The Community Noise Survey and the designation of noise zones provides the Building Department with information to locate the areas where new residential development will require the acoustical analysis presented by the California Noise Insulation Standards. The noise zones also inform the Planning Department of critical noise areas. Within any 60 dBA CNEL contour, all new multi-unit residential development requires an acoustical analysis to ensure that sound attenuation is sufficient to reduce intruding noise to 45 dBA CNEL. Currently, the Building and Safety Department checks to assure the sound transmission class of party walls and floors in multi-unit dwellings. A standard of 45 dBA CNEL is also recommended for single-family residential interior noise. This would enable the City to treat all residential units equally.

The City is using the HUD criteria of 65 dBA CNEL as an exterior noise standard. Continued use of this standard is recommended. No checks are currently made for intruding exterior noise. Building inspectors and zoning enforcement personnel should be made aware of noise standard and zones by the Planning Department so that regular inspections of exterior walls will be conducted.

Ventura County Airport is subject to Division of Aeronautics noise standards. However, the Ventura County Airport is not a designated "noise problem" airport. The 1977 65 CNEL contours do not adversely impact single-family dwellings, hospitals, schools, or churches as described in the State Noise Standard. The 60 CNEL does, however, impact R-1 zoning to the east of Ventura Road and R-1 and R-A zoning (County of Ventura) to the north of Teal Club Road. If expansion of the noise contours occur and the 65 CNEL contour impacts single-family dwellings, hospitals, schools, or churches, Ventura County Airport would be in violation of the State Noise Standards. The airport operator would then be required to comply immediately or apply for a variance which would describe a time-schedule indicating progress towards compliance. A Master Plan will be prepared shortly for Ventura County Airport. This study will define the future role of the airport.

Pacific Missile Test Center, NAS, Point Mugu is a significant noise source immediately to the south of the City of Oxnard sphere of influence. The AICUZ study completed in June 1977, and referenced in the bibliography discusses the noise impacts. The only adverse noise impact areas within the City of Oxnard sphere of influence include a mobile-home facility with the 65 to 75 CNEL contour located north of the station boundary and southwest of Highway 1, and a parcel south of Hueneme Road and west of Wood Road. The Ventura Airport Land Use Commission (ALUC) has not yet adopted any comprehensive land use plans for airports in the vicinity of Oxnard. In the meantime, Oxnard should take an active part in ALUC planning and, also, recognize the existing and future noise contours for air facilities in the area and incorporate these values into the designation of noise zones.

3. Noise Mitigation Measure

Specific design solutions for noise problems are dependent upon temporal and spacial characteristics unique to each site. The bulk of structures and/or placement of the structure does not, in itself, create noise. Structure characteristics that indirectly effect noise include "the canyon effect" and density. A canyon effect involves two opposing rows of high buildings which result in an echo reflection of sound. This canyon effect also acts as a barrier or berm by blocking high noise levels for areas behind the high buildings. Conversely, the density of the land use itself has a relationship to the amount of noise that is indigenous to the area. A high-density population area generates a high traffic density and, thus, a greater amount of noise.

The noise attenuating effects of buildings are shown on Table 12.

Table 12. BUILDING ATTENUATION

BUILDING TYPE	WINDOW CONDITION	NOISE REDUCTION DUE TO EXTERIOR OF STRUCTURE[a] (dB)	CORRESPONDING HIGHEST EXTERIOR NOISE LEVEL WHICH WOULD ACHIEVE AN INTERIOR DESIGN NOISE (dBA)
All Open Light	Ordinary	10	65
Frame	Sash: Closed	20	75
Masonry	Single Glazed	25	80
	Double Glazed	35	90

[a]Noise reduction factors higher than those shown may be used when field measurements of the structure in question indicate that a higher value is justified.

Buildings can also be utilized to attenuate noise through proper site design. If a proposal calls for a structure to be built adjacent to a noise source such as the Ventura Freeway, a highway or a rail line, then the exposed site of the building and the related floor plans can be designed so that the wall

presents a solid surface. All windows, vents, and other normal openings should be placed away from the noise source.

Site design is one of the most effective means of protecting dwelling units in a noisy environment. If a project is proposed adjacent to a freeway, highway, or rail line, the building layout can effectively attenuate noise by placing the dwelling units as far away from the noise source as possible and placing the nondwelling buildings and driveways between the dwellings and the noise source. Figure 8 depicts the possible ways of designing buildings and sites to help attenuate unwanted noise.

Noise-attenuating barriers can effectively reduce noise levels, but are accompanied by high costs. Current estimates are running $40 per linear-foot for a 10- to 12-foot masonry barrier. The effectiveness of the barrier depends on the relative height of the barrier, the noise source, the affected area and the horizontal distance between the source and the barrier, and between the barrier and the affected area. For example, a 10-foot barrier would be ineffective in attenuating noise generated from a 10-foot high exhaust stack.

At the same time, barriers are often the only measures available to attenuate adverse noise levels. They can effectively be integrated into the architectural design of a proposed project at little or no extra cost if they are initiated in early planning stages. Table 13 shows possible noise reduction from barriers.

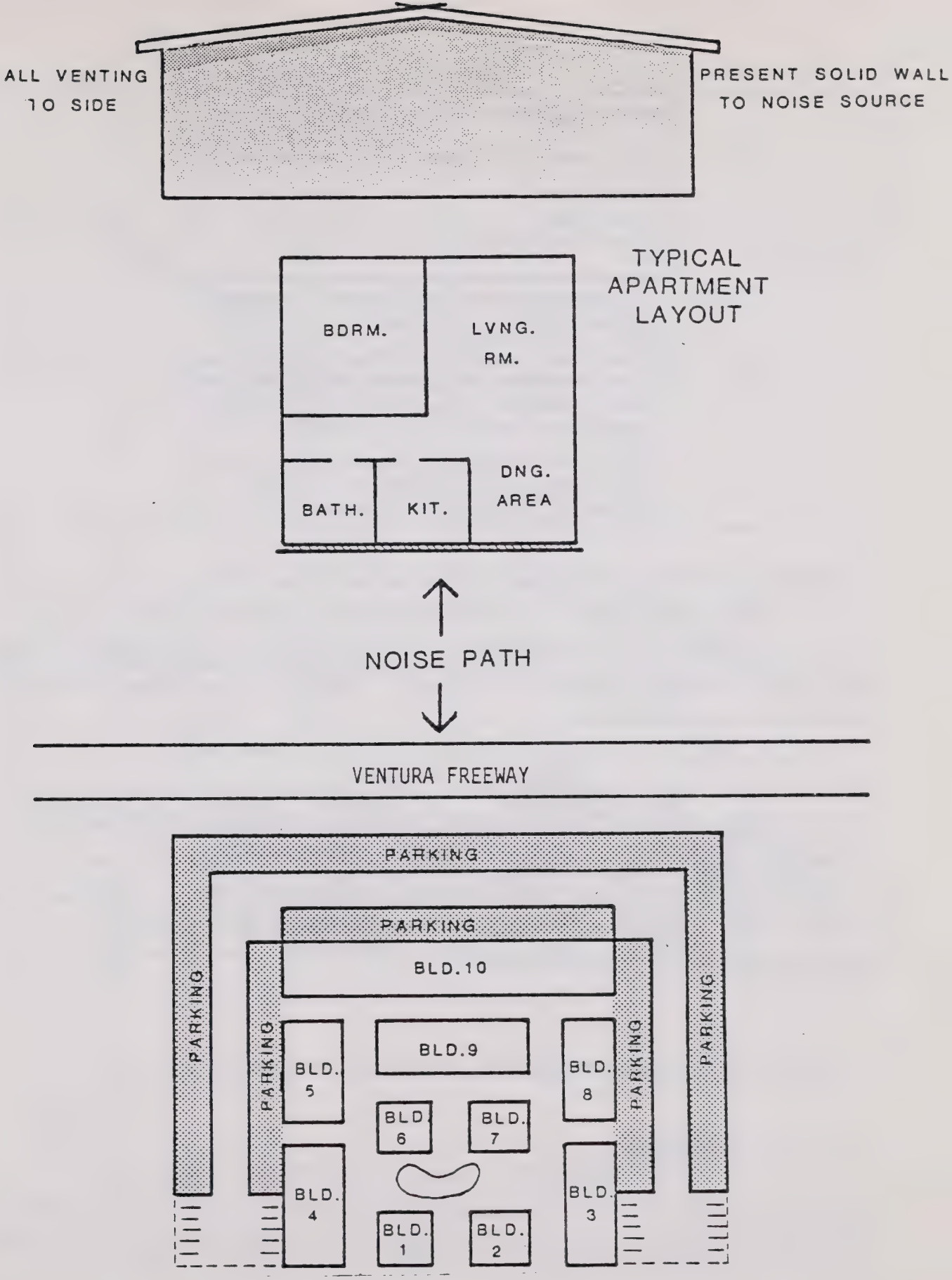


Figure 8. SITE DESIGN FOR THE ATTENUATION OF NOISE

Table 13. BARRIER NOISE REDUCTION

TYPE	NOISE REDUCTION (dB)
Earth Berm[a]	Up to 15
Block Walls[b]	Up to 15
Trees and Shrubs[c]	3 to 5

[a]The berm must be high enough to block line-of-sight situations.

[b]Block walls must be high enough to block line-of-sight situation. Walls must be long enough to prevent noise from going around the ends of the structure.

[c]Trees and shrubs must be mature and at least 100 feet in depth in order to attenuate noise by 3 to 5db.

Landscaping produces little physical noise reduction unless it is very dense and of significant depth. Its benefits include aesthetics and the possibility that it may change sound frequencies. Landscaping can also be beneficial by beautifying setbacks that attenuate noise. Figure 9 illustrates landscaping effects on noise reduction.

Aircraft noise can also be mitigated. Noise barriers or shields should be constructed adjacent to run-up areas. These types of mitigation measures will deflect the noise and reduce the noise impact of aircraft on the ground. Once in the air, aircraft noise impact can only be reduced through providing adequate separation between source and receiver, through the construction of costly barriers, or through soundproofing.

D. NOISE ENFORCEMENT PROCEDURES

1. Local Enforcement

Enforcement of a noise control program in Oxnard will necessitate a substantial community commitment. Assistance from many City departments and considerable

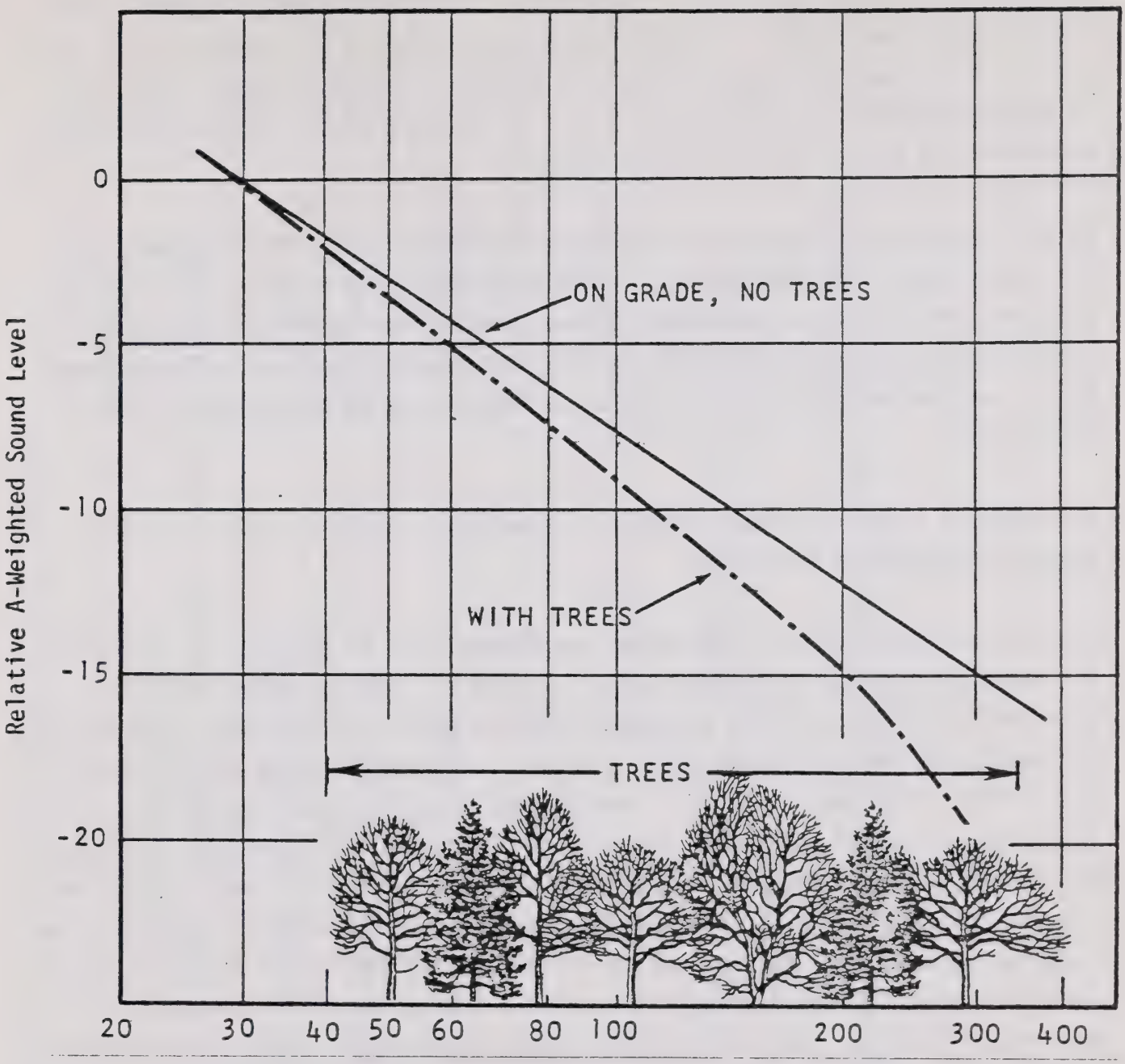


Figure 9. NOISE REDUCTION WITH OR WITHOUT TREES

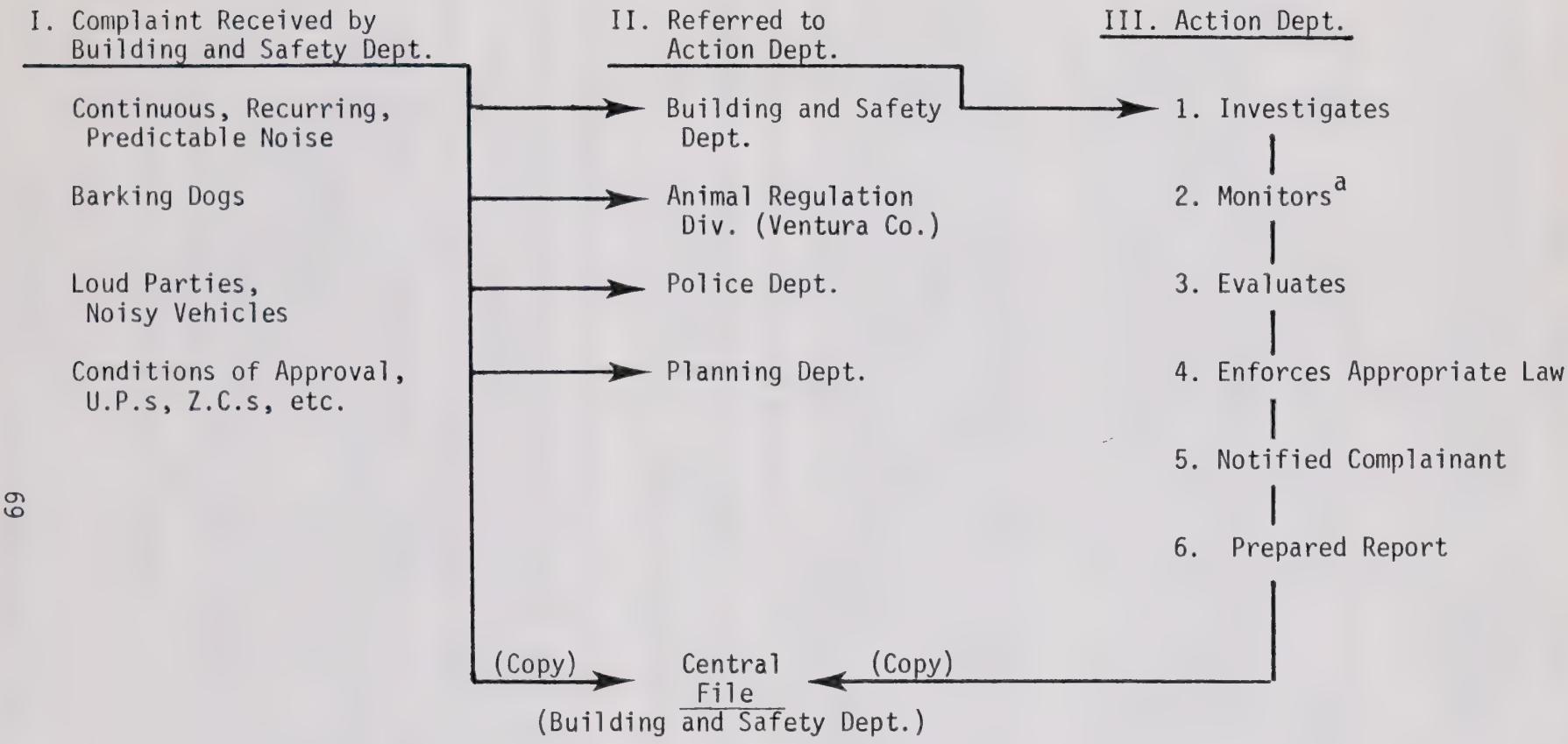
expenditures of time and funds is required. Sound measurement equipment will either need to be bought or leased and personnel trained to operate it, or this service should be contracted through the County. Community leaders will need to spend considerable time and be faced with delicate tradeoffs between noise reduction and other community priorities.

Studies sessions will need to be conducted to familiarize Planning Commissions, City Councilmen, and interested citizens with noise characteristics, enforcement problems, and the Noise Ordinance. Sound transmission factors, human perceptions, and measurement techniques must be understood. Decibels and measurement levels must be familiar to key persons so that the Noise Ordinance is clearly understood.

Following is a detailed description of a complaint, monitoring, and citation program for the City of Oxnard.

Three City departments and one County department will be involved in enforcing the Noise Enforcement Program as shown in Table 14. The Building and Safety Department will have overall responsibility for enforcing the Noise Ordinance and monitoring the noise management programs. The Building and Safety Department will also be responsible for sources that are continuous, recurring, or predictable or whose operations or noise generating capabilities can be stopped or started at a specific time. Specifics would be pumps, air conditioning and refrigeration equipment, industrial plant operations, and similar sources. The Planning Department is responsible for investigating complaints associated with noise limitations imposed as part of conditions of approval of use permits, conditional permits, subdivisions, and other standards set forth by the local zoning code. The Planning Department will require a noise analysis of all new developments including both receptor and generator standards identified in the Noise Ordinance. Currently, noise analysis is only required for major projects in noise-sensitive areas. The Police Department will investigate noise classified as infrequent, periodic, occasional or not predictable such as loud parties, disturbance of the peace, and motor vehicle operations. The Animal Regulation Division of the Ventura County Environmental Resource Agency will handle barking dog and other animal complaints. The noise monitoring will be

Table 14. NOISE ENFORCEMENT PROCEDURES FLOW CHART



[a]All monitoring performed by Building and Safety Department or Ventura County Environmental Health Agency upon written request.

conducted by either the Building and Safety Department or the Ventura County Environmental Health Agency

An enforcement procedure developed by the NEHA for use with the Model Community Noise Control Ordinance and modified to meet the needs of the City of Oxnard is described in Appendix D.

2. Distribution of Costs

As with most forms of environmental pollution, prevention of noise-related hazards may entail high economic costs. Justification of these costs comes, however, from protecting human health and reducing the physical and mental damage associated with noise.

With a growing State and Federal presence in the noise field, the City of Oxnard must be alert to new proposals or changes in existing regulations and funding to protect its vital interest. Since new freeways must be acoustically treated, this cost is currently being absorbed by State and/or Federal funds.(12)* Similarly, State and Federal highways needing remedial treatment are also funded by these levels of government.

The major budgetory noise control expenses to City government will arise from administering and coordinating noise programs including the Noise Ordinance.

Personnel must be designated to take measurements and file appropriate records. The relatively unsophisticated, hand-held noise monitoring equipment now used by the Oxnard Building and Safety Department consisting of a Type 2 Sound Level Meter is suitable only for very rudimentary noise assessments; and, the monitoring required by the Noise Ordinance should be accomplished with more sophisticated and capable equipment. The existing sound level meter should either be supplemented with a graphic level or chart recorder for documentation of noise measurements or replaced with an automatic noise monitoring system. The advantage of automatic noise monitoring systems is the capability of almost instantaneous data reduction done internally without the requirement for personnel trained in acoustical analysis. Automatic noise monitoring systems can also be

*Numbers in parenthesis denote References listed in Section VII.

left unattended for extended noise measurement periods. Automatic noise monitoring systems cost between $5 to $10,000 with maintenance costs of approximately $100 per year. These systems are built by a number of firms including B.B.N. Instrument Company, Digital Acoustics, Metrosonics Inc., and General Radio. In comparison, a graphic level recorder would cost between $2,500 to $5,500. However, this equipment would require a person trained in the equipment operation.

Enforcement of the Noise Ordinance and the Noise Management Programs would require an estimated 4 hours of a Planning Associate and 8 hours of a Building Inspector I per week. The labor cost is estimated at $145 per week. These costs are based upon use of an automatic noise monitoring system. If the existing equipment were used along with a graphic level recorder, an additional 4 hours of a Building Inspector I, trained in acoustical data reduction, is estimated at a cost of $50 per week.(13)*

The County of Ventura Environmental Resource Agency also has equipment and personnel which can be contracted for by the City of Oxnard. These services can be contracted for at a cost of $18 per hour for labor, $4 per hour for equipment, and $5 per hour for computer services. The County equipment and personnel could be substituted for the time of the Building Inspector I, but the costs are over 60 percent higher than using City personnel.(14)* However, no equipment purchases would be required for this option.

The costs to enforce the Noise Ordinance and Noise Management Program are tabulated in Table 15.

Table 15. COST ESTIMATE FOR NOISE PROGRAM ENFORCEMENT

ITEM	CITY		COUNTY
	Manual System	Automatic System	
Equipment	$2,500-$5,500	$5,500-$10,000	0
Labor (per week)			
Staff Noise	$195	$145	$343
Variance Committee	$60	$60	$60

The City Attorney's office would also be involved implementing citing and enforcement procedures. An effective Noise Management Program will involve many City employees and generate considerable expense.

The Noise Variance Committee outlined in the Noise Ordinance is another cost incurred by the City. The five committee members would be paid $50 per monthly meeting. The annual cost is projected to be $3,000 for their services.

Enforcement of noise standards are already being carried out to some degree by various City departments.

Additional costs can be passed on to the public directly through increased City taxation, or indirectly through State or Federal subsidy. City regulations and procedures will cost developers additional time and increased development costs, all of which may be passed onto the consumer. Some regulations will impact industry which also passes on higher production costs. The proposed EPA equipment purchase guidelines(15)* will be felt by the consumer in products such as cars, appliances, and tools and by the City in the purchasing of equipment.

VI. ENVIRONMENTAL IMPACT REPORT

The Noise Element of the General Plan identifies community noise sources, specifies community goals and policies, and outlines programs for the reduction of noise and minimization of its impacts. The Environmental Impact Report (EIR) on the Noise Element of the General Plan is designed to provide public agencies with principles, objectives, criteria, and definitions for application and implementation of the California Environmental Quality Act of 1970. The EIR was prepared in accordance with Section 15037(a)(1) of the State guidelines for EIRs as revised January 1, 1977. These guidelines define a project as including the adoption of local general plans or elements, thereof, pursuant to Governmental Code Section 65100-65700.

The EIR is incorporated into the Noise Element as follows:

EIR	Page No.
Description of Environmental Setting	23
Description of the Proposed Project	35
Environmental Impact	73

A. THE SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSED PROJECT

Noise is now recognized as an important consideration in planning because of its impact on human health and amenity. Noise affects the liveability and design of the environment. Specifically, noise can impair the economic health and growth potential of an area by generally reducing its desirability as a place to live.

The City of Oxnard and its planning area had a population of 99,800 in 1975. By 1990, the population is projected to grow to 147,500. This dramatic growth will occur mostly in undeveloped areas. Land use controls are particularly effective when applied to undeveloped areas especially in the vicinity of noise sources such as the Ventura Freeway and Ventura County Airport. The integration of land use/noise compatibility planning will reduce the ultimate cost of noise pollution. Remedial noise abatement measures are much more costly and difficult to implement.

Noise in the City of Oxnard affects all types of land use. The major noise-sensitive land use, however, is residential due to structural design and habitation hours. This use is also the subject of most noise laws and regulations. Other noise-sensitive land uses include school sites, hospitals, churches, and some open space uses.

The major continuing noise sources now and in the future will be produced by transportation facilities (i.e.; Ventura Freeway, highways, rail lines, and Ventura County Airport). In order that citizens may be assured that exposure to unsafe noise levels is controlled, and that adequate consideration of abatement techniques are considered, it is necessary to establish a means of controlling proposed land uses and of identifying all existing land uses which are or potentially will be noise impacted.

A local jurisdiction has the greatest opportunity to achieve noise control and abatement through effective land use and transportation planning. Unfortunately, the integration of land use/noise compatibility planning is relatively new. As a result, noise-sensitive uses such as residences, schools, and hospitals have developed near major noise sources (freeways and airports).

The Ventura County Airport at Oxnard is situated in an area of potential growth. The undeveloped area to the south of the airport around Wooley Road is experiencing residential development. The areas to the north and east have not experienced comparable development pressures. The general surrounding area will continue to experience residential and commercial growth with accompanying increases in population. This anticipated growth will have a direct

effect on the general aviation at Ventura County Airport, since general aviation is essentially generated by the suburban population. General aviation is rising due to the generally increased popularity of general aviation, the higher per capita and household income of the population, the increased leisure time, and activity.

In 1977, Ventura County Airport had 295.5 daily landings or approximately 215,000 annual operations. Golden West Airline Inc., the only scheduled commuter airline operating out of Ventura County Airport scheduled an average of 16 flights per day. These commuter passengers were transported on De Havilland and Canada Twin Otter aircraft. The average daily landings by aircraft in 1977 are shown in Table 16.

Table 16. VENTURA COUNTY AIRPORT

AVERAGE DAILY LANDINGS IN 1977	
Private jets	5.0
Turboprop	19.0
Twin-engine propeller	44.3
Single-engine propeller	224.3
Other	2.9

Over 75 percent of the aircraft using Ventura County Airport are single-engine propeller aircraft.

The day, evening and night split is shown in Table 17. The majority of the flights occur during the day with almost none at night.

Table 17. PERCENTAGE DAY/NIGHT ALLOCATION

TYPE	DAY	EVENING	NIGHT
Private jets	100	0	0
Turboprop	83	7	10
Twin-engine propeller	85	14	1
Single-engine propeller	85	14	1
Other	90	10	0

Due to the prevailing wind condition, 85 percent of all landings and takeoffs are in a westerly direction, which is on Runway 25. The remaining 5 percent are in an easterly manner, which is on Runway 7. The major pattern is the left hand touch and go pattern on Runway 25. Currently, 47 percent of all takeoffs remain in the touch and go flight pattern.

The State Division of Aeronautics has adopted the CNEL methodology as a basis for California Airport Noise Standards. The Standards place limitations on allowable airport noise intruding into residential communities and various other noise-sensitive land uses. Each class of airport is required to have a CNEL reduction every 5 years until 1986, when the level is required to be 65 CNEL. Table 18 lists the regulatory criteria for CNEL (i.e., the upper limits recommended for unsoundproofed residential use).

Table 18. CALIFORNIA CNEL STANDARD

YEAR	CLASS 1 AIRPORTS[a]	CLASS 2 AIRPORTS[b]	NEW AIRPORTS
1976	75	70	65
1981	70	70	65
1986	65	65	65

[a]Class 1 Airports have greater than 25,000 annual operations and operate four-engine turbojet or turbofan aircraft.

[b]Class 2 Airports are all other existing airports with less than 25,000 annual operations and without four-engine turbojet or turbofan aircraft.

Ventura County Airport is a Class 2 Airport and is required to meet 70 CNEL noise levels until 1986 when the more restrictive 65 CNEL is applicable.

The 1977 noise contours for Ventura County Airport indicate that the 70 CNEL (the State-adopted noise compatibility standard for single-family dwellings, hospitals, schools and churches) does not adversely impact existing land uses. The 65 CNEL does, however, impact single-family housing adjacent to Runway 25 near the northeast corner of the airport.

The future activity at Ventura County Airport will play a major role in the noise environment in the western portion of the City of Oxnard. Future operation levels at Ventura County Airport are strongly affected not only by the continued and rising demand for services and facilities, but also by the gradual foreclosure of other airport alternatives in Ventura County. Currently, there is a wide variation in opinions regarding the future role of Ventura County Airport. Only the development of an Airport Master Plan can accurately assess future activity and noise impacts. However, if operation levels continue to grow, expanding noise contours will encompass additional incompatible land uses.

The Noise Element policies and programs are directed toward preserving existing quiet areas, mitigating noise problem areas, and developing strategies to reduce future noise impact. While the noise environment within the City will improve as a result of the Noise Element, other areas will experience both negative and beneficial impacts. The following areas will be exposed to environmental impacts:

- Land Use and Landform - Implementation of this element may cause land use changes and alterations in landform. A major objective of the Noise Element is to insure noise compatible land use planning. Zoning requirements reflecting noise compatibility may restrict other less compatible uses. Design measures (e.g.; earth berms, wall) to attenuate noise will alter the existing landform. The magnitude of this impact will vary depending upon the proximity of noise-sensitive land uses to transportation routes.

  The City of Oxnard and its planning area cover 75 square miles. A large portion of this area is open space, vacant, or in agricultural use. The Noise Element will impact the development of these areas.

- Social - Noise plays a major role in our social environment and affects every facet of human activity. Noise can not only be annoying, but in some instances cause physical and psychological damage. The Noise Element is designed to relieve noise-related adverse

social impacts. However, the Noise Element may alter development trends and noise mitigation measures such as walls or barriers may break up established neighborhoods.

- Economic - Substantial economic costs are associated with both noise and noise abatement programs. These costs can range from loss of productivity to health risks.

  Noise abatement has two inherent difficulties: (1) effective noise control is expensive, and (2) there are technological limits as to how much noise reduction can be achieved. Ultimately, the tradeoffs between economic cost and desired noise level must be weighed.

  The programs identified in the Noise Element can be integrated into the existing department. However, the enforcement of the noise management programs will ultimately have to be borne by the taxpayer in some form. The costs of the noise management programs are discussed in Section V.D.2.

- Aesthetics - Noise-attenuating design features (e.g., barriers or building placement) may result in adverse visual impacts, depending upon the architectural and landscaping treatment.

- Open Space - Open space can both buffer noise-sensitive land uses and be noise-sensitive itself. The Noise Element will, therefore, result in beneficial and adverse impacts on open space.

- Noise - The purpose of the Noise Element is to provide a basis for comprehensive local programs to control and abate environmental noise. Beneficial impact will result from the Noise Element programs.

- Air Quality - Air pollutant concentrations may increase in localized areas due to noise attenuation measures such as designating truck routes and depressing roadways.

B. ANY SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF THE PROPOSAL IS IMPLEMENTED

The significant Noise Element environmental effects which cannot be avoided include: minor alterations of landform and land use for the protection of noise-sensitive uses, and additional costs to enforce the noise management programs.

C. MITIGATION MEASURES PROPOSED TO MINIMIZE THE SIGNIFICANT EFFECTS

On a larger scale, less sensitive land uses (e.g., industrial and commercial, respectively) may be placed contiguous to noise generators such as the Ventura Freeway, highways, rail lines and Ventura County Airport to mitigate the effects of noise on more sensitive activities. In addition to man-made and natural barriers, less sensitive areas such as parking sites and open areas can be utilized as noise buffers.

Construction techniques to attenuate noise can be effective methods of ameliorating noise for interior areas. These methods include treatment of all parts of buildings to reduce sound transmission. Acoustical construction is preferred for new buildings as remedial construction attentuation can be very expensive.

The implementation of the Noise Element may result in significant effects to other environmental areas. The installation of noise attenuation barriers can detract from the visual appearance of an area. Effective landscaping can improve the overall aesthetic quality.

The noise management programs will incur significant costs. State and Federal financing can bear a portion of the costs. The remaining costs will have to be disbursed throughout the community.

Ventura County Airport

Mitigation measures for Ventura County Airport are dependent upon the Airport Master Plan and future activity levels. If the airport continues to grow and

reaches its projected capacity of 284,800 annual operations, incompatible land uses will be impacted by the 65 CNEL. This will include residential land uses to the northeast and east of the airport.

Two possible mitigation measures to minimize 65 CNEL impact include extending the runway to the west and displacing the touchdown point. Extending the runway 2,000 feet to the west and not using the existing 2,000-foot eastern portion of the runway, would eliminate 65 CNEL incompatible land uses. However, the touchdown and landing points would also have to be shifted 2,000 feet to the west. Newly impacted areas to the west would primarily include open space uses. Extending the runway 2,000 feet to the west would cause it to cross Victoria Avenue. A grade separation between the runway and Victoria Avenue would be necessary. Relocating the touchdown point 1,500 feet to the west would eliminate 65 CNEL noise impact east of Ventura Road. This could be accomplished fairly easily since the remaining 4,447 feet of runway is adequate for most aircraft using the facility. However, the 65 CNEL takeoff noise levels would still impact residences immediately to the northeast of the airport.

Surface Transportation/Rail

Surface traffic is the major cause of high noise levels within the City of Oxnard. Specifically, diesel trucks produce high noise levels. Truck routes should be established to minimize truck routing through residential and other noise-sensitive uses. Truck traffic should be limited to the major throughfares in the City.

Noise reduction can be accomplished by acoustical site planning. An array of site planning considerations are available and should be utilized where practical in the City of Oxnard planning area for noise abatement. For example, the level of on-street noise increases with greater building density and, conversely, the level of off-street noise decreases due to the absorption and reflection properties of building construction. Setback requirements also reduce the impact of traffic noise. Thus, building height, construction, and open areas should be judiciously planned so that optimal noise attenuation is obtained.

Furthermore, reverberation and reflection ("canyon effect") caused by building construction can be offset through proper exterior building design.

Noise barriers achieve noise reduction by blocking the transportation path of sound. Barrier types include earth berms, fences, dense landscaping or combinations thereof. The choice depends on specific site circumstances.

Stationary Sources

If the existing noise environment is above the noise standards, a proposed project in the area should be mitigated by either enclosing the point-source in order to baffle the noise level, or designing the proposed project with solid walls facing the noise source, to mitigate noise impact.

D. ALTERNATIVES TO THE PROPOSED ACTION

The Noise Element contains a number of policies and programs for the management of noise within the City of Oxnard. These policies and programs were designed to meet the needs and desires of local citizens. Other alternatives to the Noise Element were considered and are discussed below.

- No Action - The Noise Element to the General Plan is required by State law, California Noise Planning in Land Use Act, Chapter 1632, Laws of 1971; Approved November 29, 1971, Amended by Chapter 1124, Laws of 1975; Approved September 28, 1975. If the City did not adopt a Noise Element, projects could be denied because of the City's failure to adopt all elements required for the General Plan.

- Minimum Action - This alternative is directed at adopting a Noise Element that satisfies the minimum requirements of the State law. The City of Oxnard and its planning area have large undeveloped areas. If comprehensive noise management programs are to be implemented, a thorough analysis is necessary. This alternative was not adopted since it did not offer the background material necessary to

adequately address the noise environment. Minimum action would not adequately protect citizens from adverse noise exposure. However, economic costs to the City due to enforcement of noise programs would be minimized.

- Maximum Action - This alternative would be directed at lowering noise levels to the greatest degree that will protect the health of citizens. This alternative would have far-reaching and significant impacts. It would be necessary to hire an acoustical engineer to monitor noise management programs within the City. Most major surface transportation facilities would require redesign or the construction of attenuating walls and/or berms to reduce noise levels. Effective truck routing would be an essential component to reduce noise. Property around the airport would have to be purchased displacing people and increasing costs substantially. These are only a few of the direct and indirect impacts which would result from the implementation of the "maximum action" alternative. This alternative was rejected because of the prohibitive costs to the City's economy, mobility, and overall environment.

- Other Planning, Control, and Implementation Strategies - A number of planning, control, and implementation strategies were available to the City of Oxnard for incorporation into the Noise Element. These strategies can be found in Noise Elements for other cities. Some are more or less restrictive based upon the desired noise environment. The strategies outlined in this Noise Element are based upon the community noise survey and discussions with various City departments. These strategies are felt to meet the needs of the City of Oxnard and balance environmental quality and economic costs.

E. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Over the short-term, the City's Noise Element will alter existing and proposed land uses and landforms, traffic patterns, revenue allocation, and the commitment

of energy and resources. The long-term outcome of this Element is an improved noise environment and better quality of life.

F. ANY SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

Implementation of the Noise Element would result in the following significant irreversible environmental changes: the commitment of time, energy, and resources to the noise management program; the alteration of land use and landforms and the allocation of funds to implement noise management programs.

G. THE GROWTH-INDUCING IMPACT OF THE PROPOSED ACTION

It is unlikely that the Noise Element will have an impact on population growth in the community. However, there may be secondary growth impacts associated with encouraging or discouraging residential development in specific areas. The Noise Element will direct natural residential growth away from noise problem areas.

Section VII

REFERENCES

1. U.S. Environmental Protection Agency, The Noise Control Act of 1972 Highlights, (Washington, D.C.: Printing Office, 1972), p. 1.

2. Hildebrand, "Noise Pollution: An Introduction to the Problem and an Outline for Future Legal Research," 70 Columbia Law Review, 652, (1970), p. 653.

3. U.S. Environmental Protection Agency, The Social Impact of Noise, December 1971, p. 2.

4. Nelson, Jon P., The Effects of Mobile-Source Air and Noise Pollution on Residential Property Values, Pennsylvania State University, for the U.S. Department of Commerce, April 1975.

5. Telephone conversation with Officer Fryor, Crime Prevention Unit, Oxnard Police Department, during September 5-9, 1977.

6. Telephone conversations with Dick McKintosh, Senior Building Inspector, and Mike Rameriz, Building Inspector Coordinator, Building and Safety Department, during September 5-9, 1977.

7. Telephone conversation with Larry Wallrod, Planning Department, during September 5-9, 1977.

8. Telephone conversation with Dick McKintosh, Senior Building Inspector, Building and Safety Department, during September 5-9, 1977.

9. Telephone conversations with Virginia Thompson, Animal Regulation Division, Environmental Resources Agency, Ventura County, during September 5-9, 1977, and Richard Miyahava, Building and Safety Department, on December 28, 1977.

10. Telephone conversations with Al Farascella, Assistant Public Assistance Officer, NAS Point Mugu, and Tom Murhans, Property Management Agency, Ventura County, during September 5-9, 1977.

11. Telephone conversations with Manny Sovia, and John Ramirez, Community Relations Ombudsmen, during September 5-9, 1977.

12. California Department of Transportation, Policy and Procedure memorandum No P74-47, July 24, 1974.

13. Telephone Conversation with Alice Haskins, Payroll Section, Finance Department, on January 20, 1978.

14. Telephone conversation with Mervin Johnson, Environmental Health, Environmental Resources Agency, Ventura County, on January 20, 1978.

15. Code of Federal Regulations, Title 40, Parts 203.0-203.8, March 25, 1974.

Section VIII

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Appendix A

NOISE MANAGEMENT PROGRAMS QUESTIONNAIRE

APPENDIX A

NOISE MANAGEMENT PROGRAMS QUESTIONNAIRE

NAME _____

NEAREST INTERSECTION _____

(Circle Response)

1. What do you view at the major problem in the City of Oxnard?

1. Traffic	2	3. Environment Problem	4	5. Housing	
2. Crime	37	4. Unemployment	2	6. Other	10

2. What do you view as the major environmental problem in the City?

1. Air Quality	7	3. Congestion	7	5. Incompatible land Use	13
2. Noise	13	4. Water Quality	3	6. Other	10

3. Are you affected by noise in your daily life?

1. Often	19	2. Sometimes	34	3. Never	5

4. Does noise disturb you at home?

1. Often	12	2. Sometimes	37	3. Never	7

5. Describe the noise environment in your neghborhood.

1. Quiet	15	3. Loud but not disturbing	2
2. Constant disturbing noise	11	4. Infrequent but loud noise	29

6. Which two types of noise disturb you the most at home?

1. Construction	1	5. Loud parties/dog barking	18
2. Railroad		6. Freeway	1
3. Aircraft	17	7. Trucks/Motorcycles	24
4. General Traffic	14	8. Other	15

7. Which of the types of noise in Question 6 is more disturbing;

during the day traffic(10), motorcycles(10), aircraft(8), dogs(3)
during the night dogs/loud parties (14), traffic(8), motorcycles(7), sirens(3), aircraft(2)

8. What do you consider the most annoying noise source in the City?

Motor vehicles - (28), Aircraft - (11), Sirens - (7), Dogs (4)

9. Additional comments: _____

If you have questions regarding this questionnaire contact Tom Fitzwater (Olson Laboratories) (714) 533-6541 or Don Hineser (City of Oxnard) (805) 486-2601 Ext. 292.

Appendix B

TRAFFIC, RAILROAD, AND AIRPORT ACTIVITY

Appendix B

TRAFFIC, RAILROAD, AND AIRPORT ACTIVITY

The 1977 noise contours were based upon the following traffic, railroad movements, and the Ventura County Airport activity.

Segment	General Description	ADT	MPH	%TKS
a	Pleasant Valley-Saviers	11,780	35	15
b	H St. - Hueneme	3,774	35*	2
c	Hueneme-Saviers	8,981	35*	6
d	Saviers-Hueneme	6,670	35*	2
e	Cypress-Hueneme	840	35*	0
f	Hueneme-Olds	5,710	35*	6
a	Hueneme-Past Olds Rd.	6,030	35*	3
h	Olds-Hueneme	1,085	35*	0
i	Etting-Oxnard Blvd.	1,200	35*	0
j	Oxnard Blvd.-Past Pleasant Valley	17,000	55	10
k	Pleasant Valley-Past Oxnard	5,050	45*	10
l	Olds Rd.-Pleasant Valley	590	45*	0
m	Pleasant Valley-Oxnard Blvd.	12,510	45	15
n	Rose Ave.-Pleasant Valley	3,036	35*	0
o	Pleasant Valley-Olds Rd. & Etting Rd.	13,761	45	15
p	Pleasant Valley-(bend)	11,530	35	15
q	Pleasant Valley-Cypress	13,030	35*	15
r	Saviers-Pleasant Valley	18,130	40	15
s	Saviers-Bard	22,830	40	15
t	Channel Island-Cloyne	15,825	35*	2
u	Cloyne-past Channel Island	3,600	25	0
v	Channel Island-Oxnard Blvd.	10,200	35	2
w	Oxnard Blvd.-Pleasant Valley	15,000	55*	10
x	Channel Island-Oxnard Blvd.	6,110	35	2
y	Channel Island-Rice Ave.	5,450	35	2
z	Rice Ave.-Pleasant Valley	5,520	35*	5
aa	Rice Ave.-Channel Island	10,670	35*	5
ab	Wooley Rd.-Rice Ave.	3,480	35	2
ac	Wooley Rd.-Oxnard Blvd.	6,866	35	2
ad	Oxnard Blvd.-Wooley Rd.	14,800	45	10
ae	Savier-Wooley Rd.	25,000	35	15
af	Saviers-Channel Island	24,240	40*	15
ag	Gisler Ave.-Channel Island	4,180	25	1
ah	Oxnard Blvd.-Channel Island	14,800	55	10
ai	Rice Ave.-Wooley Rd.	13,680	35*	11
aj	Rose Ave.-Wooley Rd.	4,410	35*	11
ak	Oxnard Blvd.-Fifth St.	34,000	30	20
al	Fifth St.-Rose Ave.	13,000	30	5
am	Fifth St.-Rice Ave.	10,100	30*	5
an	Fifth St.-past Rice	6,200	30*	5
ao	Rice Ave.-Fifth St.	12,570	35*	11
ap	Colonia Rd.-Rice Ave.	2,560	45	2
aq	Rose Ave.-Colonia	10,000	35	3
ar	Third St.-Rose Ave.	4,120	25	3
as	Third St.-Oxnard Blvd.	8,420	25	5
at	Colonia-Rose Ave.	4,730	45	5
au	Rose Ave.-Colonia Rd.	8,280	35	5
av	Rice Ave.-Colonia Rd.	12,410	50	7
aw	Rice Ave.-Gonzales Rd.	13,370	35	7
ax	Gonzales Rd.-Rice Ave.	3,980	35*	2
ay	Rose Ave.-Gonzales Rd.	11,100	35*	2
az	Gonzales Rd.-Rose Ave.	7,450	45	9
bb	Oxnard Blvd.-Gonzales Rd.	31,500	45	7
bc	St. Mary's-Oxnard Blvd.	4,460	35*	0
bd	Vineyard Ave.-Rt. 101	17,000	35	3
be	Rt. 101-Rose Ave.	51,000	55*	10
bf	Rose Ave.-Rt. 101	6,950	50	3
bg	Rose Ave.-Above Rt. 101	3,980	50	3

*Speeds not directly provided by the city. Values estimated from nearest segment for which data was provied by the city.

Segment	General Description	ADT	MPH	%TKS
bh	Rt. 101-Rice Ave.	53,000	55*	10
bi	Rice Ave.-Rt. 101	4,650	45	8
bj	Rice Ave.- above Rt. 101	5,730	50*	3
bk	Rt. 101-past Rice Ave.	50,000	55*	10
bl	Rt. 101-before Oxnard Blvd.	60,000	55*	10
bm	Rt. 101-Vineyard Ave.	44,000	35	10
bn	Oxnard Blvd.-below Rt. 101	26,000	55*	7
bo	Ventura Rd.-Gonzales Rd.	15,857	55	3
bp	H St.-Gonzales Rd.	9,052	25	0
bq	Vineyard Ave.-Oxnard Blvd.	8,363	35*	0
br	C St.-Gonzales	7,489	35	0
bs	Gonzales Rd.	4,600	45	1
bt	Gonzales Rd.-Ventura Blvd.	4,607	45*	1
bu	Gonzales Rd.-H St.	14,430	45	5
bv	Gonzales Rd.-C Street	16,160	35	5
bw	Ventura Blvd.-Doris Ave.	27,602	45	5
bx	H St.-Doris Ave.	5,877	25	1
by	C St.-Doris Ave.	10,670	25	1
bz	Doris Ave.-C St.	4,227	25	0
cc	Doris Ave.-H St.	2,500	25	0
cd	Doris Ave.-Ventura Blvd.	3,380	35	0
ce	Victoria-Fifth St.	3,870	35	1
cf	Between Doris & Teal Club	150	25*	0
cg	Teal Club-Victoria Blvd.	700	30*	3
ch	Ventura Rd.-Fifth St.	24,260	45	5
ci	H St.-Fifth St.	5,172	25	2
cj	C St.-Fifth St.	10,738	25	2
ck	Fifth St.-C St.	10,800	30	2
cl	Fifth St.-Ventura Blvd.	9,533	30*	2
cm	Fifth St.-Patterson Rd.	4,840	30*	1
cn	Fifth St.-Victoria	4,910	30*	1
co	Harbor Blvd.-Fifth St.	10,410	55	0
cp	Harbor Blvd.-Fifth St.	8,180	55	1
cq	Harbor Blvd.-Channel Island	10,580	55	1
cr	Victoria-Wooley	6,590	35*	1
cs	Patterson-Wooley	1,870	25*	0
ct	Ventura Blvd.-Wooley	23,128	45	9
cu	H St.-Wooley	6,251	25	2
cv	C St.-Wooley	14,070	25	2
cw	Wooley-C St.	7,910	30	2
cx	Wooley Rd.-H St.	4,120	35	2
cy	Wooley Rd.-Ventura Blvd.	3,312	35	0
cz	Wooley Rd.-Patterson Rd.	1,450	35	0
dd	Victoria Ave.-Hemlock	7,230	45	2
de	Patterson Rd.-Hemlock	2,380	25*	0
df	Ventura Blvd.-Hemlock	17,010	45*	5
dg	C St.-Channel Island	10,103	25	2
dh	Hemlock-H St.	2,810	30*	3
di	Hemlock-Ventura Blvd.	5,641	25	2
dj	Hemlock-Patterson Rd.	4,499	40	0
dk	Victoria Ave.-Channel Island	10,420	45	2
dl	Channel Island-Victoria	15,150	35	0
dm	Rd. below Harbor Blvd. as it turns into Channel Island Blvd.	5,603	35	0
dn	Victoria Ave.-Channel Is.	7,860	55	0
do	Channel Is.-Ventura Blvd.	12,080	35	1
dp	Channel Is.-Ventura Blvd.	15,890	35	2
dq	Channel Is.-H St.	16,470	35	2
dr	C St.-Bard Rd.	8,276	25	2

Segment	General Description	ADT	MPH	%TKS
ds	H St.-Bard Rd.	5,173	25	0
dt	Ventura Blvd.-Channel Is.	24,612	45*	7
du	Bard Rd.-H St.	4,210	25	4
dv	C St.-Pleasant Valley	5,436	25	2

Railroad Data - 1977

Southern Pacific Railroad

Passenger:	Trains	7:00 a.m. - 10:00 p.m. = 2 per day 10:00 p.m. - 7:00 a.m. = 0
	Average Speed:	35 mph
Freight:	Trains	7:00 a.m. - 10:00 p.m. = 15 per day 10:00 p.m. - 7:00 a.m. = 5 per day
	Average Speed:	35 mph
	Average Length:	5,500 feet

Ventura County Railroad

Passenger: None

Freight: 1 per day

- Starts and stops along the way to unload and load freight.
- No night operations.
- Average 6 cars in length; somtimes as many as 12 cars.

Airport - 1977

The Ventura County Airport noise contours were developed from the following:

AVERAGE DAILY LANDINGS

Private Jets	5.0
Turboprop	19.0
Twin-Engine Propeller	44.3
Single-Engine Propeller	224.3
Other	2.9
	295.5

The day/night allocation as listed:

PERCENTAGE DAY/NIGHT ALLOCATION

Type	Day	Evening	Night
Private Jets	100	0	0
Turboprop	83	7	10
Twin-Engine Propeller	85	14	1
Single-Engine Propeller	85	14	1
Other	90	10	0

Commuter Air Carrier Background Data

Golden West Airlines, Inc.
(De Havilland Canada Twin Otter)

GOLDEN WEST AIRLINES, INC.

DEPARTURE AT VENTURA COUNTY AIRPORT

TIME PERIOD	SU	MO	TU	WE	TH	FR	SA	TOTAL	AVG. PER DAY
7:00 a.m. - 10:00 p.m.	13	16	17	17	15	15	10	103	14.7
10:00 p.m. - 7:00 a.m.	2	2	2	2	2	2	--	12	1.7
Total	15	18	19	19	17	17	10	115	16.4

Source: Official Airline Guide, May 15, 1977.

Appendix C

RESPONSES TO COMMENTS ON THE NOISE ELEMENT ENVIRONMENTAL IMPACT REPORT

OLSON LABORATORIES
DIVISION OF SYSTEMS CONTROL, INC.

June 14, 1978

78292
7604-100

Mr. Donn Hineser
City of Oxnard
Planning Department
305 W. 3rd Street
Oxnard, California 93030

Subject: Responses to May 18 Planning Commission Public Hearing Comments

Dear Donn,

Question 1: Inquired as to whether the same criteria would be used for setting standards in each zone of the City or if different criteria would be used for different areas.

Response: The noise standards are covered in the Draft Noise Element pages 42-45. The City is divided into four noise zones; quiet residential, active residential, commercial, and industrial. The noise zones are determined by the existing noise environment and examination of zoning. The various zones of the City have specific standards based on noise and land use compatibility.

Question 2: Why doesn't the City have their own noise equipment?

Response: The City of Oxnard has a Type 2 Sound Level Meter (see page 64-65). The Building and Safety Department uses this equipment to make general noise measurements.

Question 3: Who regulates off-road vehicle noise?

Response: Motor vehicle noise is discussed on pages 51 and 55 of the Draft Noise Element. The California Motor Vehicle Code sets operational noise limits for motor vehicles (Section 23130), requires an adequate muffler in constant operation and properly maintained (Section 27150), prohibits the sale or installation of a motor vehicle exhaust system unless it meets regulations or standards (Section 27150.1), prohibits the modification of the exhaust system to amplify or increase the noise above that of the original system (Section 27151), prohibits the sale of new vehicles exceeding the noise limits (Section 27160), and sets noise limits for the operation of off-highway motor vehicles (Section 38280) as shown in Table 11. Police and traffic officers enforce this code.

13605 Anaheim Blvd. Suite 139 • Anaheim, California 92805 • Telephone [illegible]

The City of Oxnard does enforce State regulations through the Police and Building and Safety Departments. Currently, the Police Department responds to complaints of loud vehicles and issues equipment citations to force violators to make necessary modification. Enforcement of off-road vehicles and "dirt-bike" regulations depends largely on complaint activity. Occasionally an officer will stop a blatently loud vehicle and issue such a citation.

Question 4: Could you expand on noise mitigation measures?

Response: Noise mitigation measures are discussed on pages 57-62 and 73-75 of the Draft Noise Element. Walls and berms (see page 60) are some of the measures available to attenuate adverse noise levels. The burden for constructing and designing a noise barrier falls upon the developer. The City's role is to identify when a noise barrier is required and verify that the barrier will adequately reduce noise levels. A simple procedure for estimating noise reduction of walls and barriers will be provided as part of the Noise Mangement Program.

Question 5: How does the Draft Noise Element relate to the Noise Element prepared by the Ventura County, Environmental Resources Agency for the City of Oxnard?

Response: The Table of Contents for the Noise Element prepared by Ventura County for the City of Oxnard is shown below. A comparison of the County prepared Element and the City Draft Noise Element is discussed.

County Prepared Noise Element	Draft Noise Element
Introduction	Similar (see I-A I-C)
General Description of Noise	Similar (see II-A and II-B)
General Effects of Noise	Similar (see II-E)
Noise Evaluation Schemes	Similar (see II-C and II-D) The Ventura County Element uses the CNEL methodology for noise contouring as does the Draft Noise Element.
General Inventory of Noise	Similar (see III-A)
Local Inventory of Sources	The Draft is much more comprehensive based on 128 noise measurement sites (see III-B) and a report Volume II Noise Measurement Program.

Management Responsibilities	Similar (see V-C)
Findings	Similar (see I-E)
Options	The County provided a variety of noise mitigation measures. The recommendation in the Draft were based on preliminary planning staff reviews.
Recommendations on Options	The objective identified in the County Element and the Goal in the Noise Element are very similar. The standards, controls, and implementation recommendations in the County Element can be combined to form the policies and programs of the Draft Noise Element. No significant conflicts are found.

Yours very truly,

Thomas W. Fitzwater
Sr. Environmental Planner

TWF/jp